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ANNUAL REPORT

OF THE

ILLINOIS FARMERS' INSTITUTE

WITH REPORTS OF

County Farmers' Institutes

FOR THE YEAR 1903.

SRINGFIELD, ILL.
PHILLIPS BROS., STATE PRINTERS.
1903.

J. H. COOLIDGE, President, Galesburg, Ill.

J. H. COOLIDGE, President, Galesburg, Ill.

ORGANIZATION OF ILLINOIS FARMERS' INSTITUTE.

EXCHANGE
LIBRARY
STATE COLLEGE OF
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Officers, 1902.

President—J. H. Coolidge..Galesburg
Vice President—H. G. Easterly..Carbondale
Treasurer—A. P. Grout..Winchester
Secretary and Superintendent of Institutes—A. B. Hostetter........................Springfield

BOARD OF DIRECTORS.

Ex Officio.

Superintendent of Public Instruction—Alfred Bayliss........................Springfield
Dean of the College of Agriculture—Eugene Davenport........................Urbana
President State Board of Agriculture—James K. Dickirson........................Lawrenceville
President State Horticultural Society—H. A. Aldrich........................Neoga
President State Dairymen's Association—Joseph Newman........................Elgin

ELECTIVE BY CONGRESSIONAL DISTRICTS.

Dist.		
1.	C. P. Reynolds	4220 Calumet ave., Chicago
2.	B. R. Pierce	562 42d st., Chicago
3.	Merrill K. Sweet	Glenwood
4.	W. Malcom Manley	828 W. 43d st., Chicago
5.	....	
6.	F. C. Rossiter	91 Washington st., Chicago
7.	James Frake	182 LaSalle st., Chicago
8.	John M. Clark	71 W. Monroe st., Chicago
9.	Jacob F. Rehm	1768 Denning ct., Chicago
10.	H. D. Hughes	Antioch
11.	Judson P. Mason	Elgin
12.	B. F. Wyman	Sycamore
13.	A. F. Moore	Polo
14.	E. N. Cobb	Monmouth
15.	J. N. Coolidge	Galesburg
16.	Ralph Allen	Delavan
17.	S. Noble King	Bloomington
18.	F. I. Mann	Gilman
19.	E. E. Chester	Champaign
20.	A. P. Grout	Winchester
21.	Edward Grimes	Raymond
22.	E. W. Burroughs	Edwardsville
23.	Fred C. Goodnow	Salem
24.	Israel Mills	Clay City
25.	H. G. Easterly	Carbondale

STANDING COMMITTEES.

Executive Committee.

J. H. Coolidge, James Frake, F. I. Mann,
H. G. Easterly, B. F. Wyman.

Finance Committee.

E. W. Burroughs, E. N. Cobb, Ralph Allen,
M. K. Sweet, J. H. Coolidge.

Legislative Committee.

E. E. Chester, F. C. Goodnow, Jacob F. Rehm,
Edward Grimes, J. H. Coolidge.

Committee on Domestic Science.

H. D. Hughes, J. P. Mason, A. F. Moore,
B. R. Pierce, J. H. Coolidge.

Committee on Ways and Means of Improving County Farmers' Institutes.

Joseph Newman, J. M. Clark, W. M. Manley,
Israel Mills, J. H. Coolidge.

Committee on Agricultural Education in the Public Schools.

Alfred Bayliss, Eugene Davenport, C. P. Reynolds,
F. C. Rossiter, J. H. Coolidge.

Committee on Soil Investigation and Experiments.

Walter R. Kimsey, Ralph Allen, E. W. Burroughs,
H. G. Easterly. H. D. Hughes.

Auditor.

S. Noble King.

ORGANIZATION OF ILLINOIS FARMERS' INSTITUTE.

Officers, 1903.

President—H. G. Easterly	**Carbondale**
Vice President—B. F. Wyman	**Sycamore**
Treasurer—A. P. Grout	**Winchester**
Secretary—A. B. Hostetter	**Springfield**

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13.	A. F. Moore	Polo
14.	E. N. Cobb	Monmouth
15.	J. H. Coolidge	Galesburg
16.	Ralph Allen	Delavan
17.	S. Noble King	Bloomington
18.	Geo. W. Hobson	Homer
19.	E. E. Chester	Champaign
20.	A. P. Grout	Winchester
21.	Edward Grimes	Raymond
22.	E. W. Burroughs	Edwardsville
23.	Fred C. Goodnow	Salem
24.	Israel Mills	Clay City
25.	H. G. Easterly	Carbondale

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Executive Commmittee.

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Finance Committee.

M. K. Sweet, Israel Mills, E. W. Burroughs, H. G. Easterly. E. N. Cobb.

Legislative Committee.

Edward Grimes, A. P. Grout, George W. Hobson, H. G. Easterly. Jacob F. Rehm.

Committee on Domestic Science.

S. Noble King, H. A. Aldrich, Amos F. Moore, H. G. Easterly. B. R. Pierce.

Committee on Ways and Means of Improving County Farmers' Institutes.

Joseph Newman, W. M. Manley, James K. Dickirson, H. G. Easterly. J. M. Clark.

Committee on Agricultural Education in the Public Schools.

Alfred Bayliss, F. C. Rossiter, Eugene Davenport, H. G. Easterly. C. P. Reynolds.

Committee on Soil Investigations and Experiments.

Ralph Allen, F. C. Goodnow, J. H. Coolidge, H. G. Fasterly. J. P. Mason.

Auditor, **E. W. Burroughs.**

Superintendent, **Frank H. Hall.**

AN ACT CREATING THE ILLINOIS FARMERS' INSTITUTE.

SECTION 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly:* That to assist and encourage useful education among the farmers, and for developing the agricultural resources of the State, that an organization under the name and style of "Illinois Farmers' Institute" is hereby created, and declared a public corporation of the State.

§ 2, It shall consist of three delegates from each county of the State, elected annually at the Farmers' Institutes for said county by the members thereof.

§ 3. The affairs of the Illinois Farmers' Institute shall be managed by a board of directors, consisting of

1. State Superintendent of Public Instruction.
2. Professor of Agriculture of the University of Illinois.
3. President of the State Board of Agriculture.
4. President of the State Horticultural Society.

5. President of the State Dairymen's Association, and one member from each congressional district of the State, to be selected by the delegates from the district present at the annual meeting of this organization: *Provided,* That the members first selected from the congressional districts of even number shall serve for one year, and the members first selected from the congressional districts of odd numbers shall serve for two years, and that the members selected thereafter to fill expired terms of office shall serve for the period of two years.

§ 4. The board of directors of the Illinois Farmers' Institute shall have sole care and disposal of all funds that may be appropriated by the State to sustain the organization, and shall expend the same in such manner as in their judgment will best promote the interest in useful education among the farmers and develop the agricultural resources of the State. The Illinois Farmers' Institute shall make annual report to the Governor of its transactions, which report shall include papers pertaining to its work and addresses made at the annual meeting of the organization, and a classified statement of all moneys received and of all expenditures made, and twenty thousand (20,000) copies of said report shall be printed on or before September 1 of each fiscal year, one-half for the use of the Illinois Farmers' Institute, and the remainder to the Secretary of State for distribution. It shall make no appropriation without funds in hand to meet the same, and the State of Illinois shall in no event be held liable or responsible for debt, obligation or contract made by the Illinois Farmers' Institute or its board of directors.

§ 5. There shall be held annualy, under the direction of the board of directors, between October 1 and March 1, following of each year, a public meeting of the delegates from County Farmers' Institutes and of farmers of this State, at such time and place as may be determined by the board of directors, of not less than three (3) days' duration, which meeting shall be held for the purpose of developing the greater interest in the cultivation of crops, in the care and breeding of domestic animals, in dairy husbandry, in horticulture, in farm drainage, in improved highway, and general farm management, through and by means of liberal discussions of these and kindred subjects and any citizen may take part in these meetings but only duly elected and accredited delegates from County Farmers' Institutes shall be permitted to vote in the election of the board of directors.

§ 6. The members of each new board of directors shall enter upon their duties the second Tuesday after their election and hold their offices for one or two years as provided in section 3, or until their successors are elected and enter upon their duties.

The board of directors shall have power to fill vacancies in the board.

It shall organize by the election of a president, vice-president, treasurer and secretary, who shall hold their offices for one year; their term of office to begin July 1st following their election.

It shall employ such superintendents, speakers and clerks as may be deemed proper for organizing and conducting the work of the Illinois Farmers' Institute and provide for their compensation by the rules of the board of directors.

The secretary and the treasurer may be other than members of the board of directors.

The salary of the secretary shall be two thousand dollars ($2,000) a year, payable in monthly installments.

The Auditor of Public Accounts is hereby authorized to draw his warrant on the State Treasurer monthly for the salary of the Secretary of the Illinois Farmers' Institute as herein provided, payable out of any fund in his hands not otherwise appropriated.

§ 7. Rooms in the capitol building shall be assigned to the officers of this organization by the proper authority, which shall then be under the control of the board of directors.

§ 8. The board of directors may make and enforce such rules and by-laws, not in conflict with the laws of this State, as will render its work most useful and efficient.

§ 9. For the purpose mentioned in the preceding sections, said board of directors may use such sum as it may deem proper and necessary, not exceeding the amount appropriated therefor by the General Assembly from the general fund for that purpose: *Provided further*, that the

1. State Superintendent of Public Instruction,
2. Professor of Agriculture of the University of Illinois,
3. President of the State Board of Agriculture,
4. President of the State Horticulture Society,
5. President of the State Dairymen's Association,

And the present congressional representatives of the Illinois Farmers' Institute Association shall constitute the first board of directors of this organization, who shall have charge of the affairs of the same until their successors have been duly elected, and enter upon their duties as provided in this act. [As amended and approved May, 1903.

An act making appropriation for the Illinois Farmers' Institute and county farmers' institute:

WHEREAS, To assist and encourage useful education among farmers and for developing the agricultural resources of the State, the Thirty-ninth General Assembly created an organization under the name and style of the Illinois Farmers' Institute, and intrusted to it the development of greater interest in the cultivation of crops, in the breeding and care of domestic animals, in dairy husbandry, in horticulture, in farm drainage, in improvement of highways and general farm management, through and by means of liberal discussions of these and kindred subjects, and for improving the condition of the farmer by affording a better knowledge of successful agriculture: therefore, to sustain the same,

SECTION 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly:* That there be and is hereby, appropriated to the Illinois Farmers' Institute the following sums, to-wit:

§ 2. For clerk hire, typewriter, etc., the sum of one thousand dollars ($1,000) per annum for the fiscal years beginning July 1, 1903 and 1904.

§ 3. For expressage, postage, office expenses, furniture, etc., the sum of one thousand five hundred dollars ($1,500) per annum for the fiscal years beginning July 1, 1903 and 1904.

§ 4. For the purchase of books for, and the maintenance and management of the Illinois Farmers' Institute libraries, the sum of two thousand five hundred dollars ($2,500) per annum for the fiscal years beginning July 1, 1903 and 1904.

§ 5. For the actual expenses of the members of the board of directors and officers of the Illinois Farmers' Institute in the performance of their duties as said members and officers, for the expenses of the State institute meeting, for the employment of specially qualified institute instructors, and for the incidental expenses in promoting the development of the farmers' institute work throughout the State, the sum of five thousand dollars ($5,000) per annum for the fiscal years beginning July 1, 1903 and 1904.

§ 6. For the use of each county farmers' institute for the purpose of holding one or more farmers' institute meetings in each county in the State under the full direction of the county farmers' institute officers of each county, the sum of seventy-five dollars ($75) per annum for the fiscal years beginning July 1, 1903 and 1904, to be paid to the treasurer of each county farmers' institute when such institute shall file with the secretary of the Illinois Farmers' Institute a sworn statement which shall show that said county farmers' institute has held one or more duly advertised public sessions annually, of not less than two days each, at some easily accessible location, which shall include an itemized statement of the expenses of said meeting, with receipted vouchers therefor, a copy of its printed program, and a report of proceedings, showing the title and author of the papers read and by whom discussed, place or places of meeting, with average daily attendance and such other information as may be called for by the Illinois Farmers' Institute and necessary to successfully assist this work.

§ 7. No officer nor officers of any county farmers' institute shall be entitled to receive any moneyed compensation whatever for any service rendered the same.

§ 8. That on the order of the president, countersigned by the secretary, of the Illinois Farmers' Institute, and approved by the Governor, the Auditor of Public Acconnts shall draw his warrant on the Treasurer of the State of Illinois, in favor of the treasurer of the Illinois Farmers' Institute, for the sum herein appropriated: Provided, That each warrant on account of the county farmers' institute shall show the county institute for whose benefit the same is drawn: Provided further, That the program and report of proceedings of the county farmers' institute for each warrant is drawn shall show that some of the following topics have been presented and discussed, viz.: Grain farming, stock feeding and breeding. dairy husbandry, orchard and small fruit culture, farmer's garden, domestic science and any subjects pertaining to farm life; provided further, that if the necessary expense of a county farmers' institute shall not equal the sum of seventy-five dollars ($75) as aforesaid, then said warrant shall only be drawn for the sum expended.

§ 9. It shall be the duty of the treasurer of the Illinois Farmers' Institute to pay over to the treasurer of each county farmers institute the sum of seventy-five dollars ($75), or so much thereof as may be received for its use and benefit, as aforesaid, and make annual report to the Governor, as provided by law.

Approved May, 1903.

LOCAL ORGANIZATION FOR PROMOTING THE ILLINOIS FARMERS' INSTITUTE MEETING, AT BLOOMINGTON, FEBRUARY 24, 25, 26, 1903.

COMMITTEES.

Reception—B. F. Harber, Maurice Levy, John Eddy, S. R. White, Louis Fitz Henry, J. O. Wilson, J. A. Beck, C. W. Klemm, R. F. Evans, F. B. Capen, J. J. Cowden.

Domestic Science and Decoration—Mrs. S. Noble King, Mrs. Jennie C. Barlow, Miss Sallie Anthony.

Advertising and Press—Milton R. Livingston, J. W. Rodgers, L. W. Howard, J. E. Johnson, C. L. Schneider.

Executive—Paul F. Beich, J. F. Heffernan, George W. Stubblefield, Sig Heldman, F. Oberkoetter, C. E. Stewart, C. Rayburn, F. M. Follick.

Entertainment—John A. Beck, A. Dolan, J. B. Lennon, D. C. Herrick, B. Strickland.

Ushers—E. E. Jones, W. F. Young, Albert Peterson, Price Downs, Phineas Perry, Elmer Rust, Burt Bayler, W. E. Rayburn, Lawrence Stubblefield, W. A. Orendorf, Wm. Barlow, Edwin O. Ropp, S. E. Lantz, F. A. Walker, Lawrence Funk, Edward Heller, Warren White.

R. F. Berry, Secretary, Unity Building.

The several hotels have agreed to the following rates:

The Illinois, $2.50 to $4 per day.

The Hills, $2 to $2.50 per day.

The Apartment, $2 single, $1.50 double per day.

The Wait, $1 to $1.25 per day.

Boarding houses and restaurants, not more than the regular rates.

ANNOUNCEMENT.

The board of directors of the Illinois Farmers' Institute and the officers of the Illinois Association of Domestic Science extend a cordial invitation to the members of the several County Farmers' Institute, to the farmers, horticulturalists, dairymen, live stock breeders, and gardeners of Illinois, also to the members of the Domestic Science Associations and Women's Clubs, the housekeepers and home makers and all others who are interested in the development of the resources of the State and the upbuilding of our homes. The meetings are free to the public and there will be an opportunity for the general discussion of all topics on the program.

The program covers a wide range of practical subjects which will be presented and discussed by those of recognized ability and experience in their respective line of work.

WILL BEGIN ON TIME.

The sessions will begin on time as advertised in the program, with class work in corn judging and corn breeding, domestic science, horticulture and live stock, in the places designated, at 9:00 o'clock a. m. Tuesday, Feb. 24, 1903.

It will pay all visitors to be on hand at the opening, prepared to stay till the close of the institute.

EXCURSION RATES.

Do not forget that a rate of one and one-third fare is granted on all railroads in Illinois. The ability of the Farmers' Institute to secure reduced rates from the railroads depends upon the number of tickets sold. It is desirable therefore that delegates, speakers and all parties buy round trip tickets in preference to using credential or mileage books.

ELECTION OF DIRECTORS.

The term of office of the Institute Directors of the even numbered districts expires on the 1st day of March, 1903. The delegates in attendance at the annual meeting at Bloomington from those districts will select directors for the ensuing two years. Under the law creating the Illinois Farmers' Institute "only duly accredited delegates from County Farmers' Institutes shall be permitted to vote in the election of the board of directors." The convention for the election of directors will be held in Bloomington, Ill., Feb. 24, 1903, at 5:00 o'clock p. m., in the Coliseum building.

REPORTS OF DELEGATES.

Delegates are requested to report in writing any features that have proved of special value in the county institutes of their respective counties. Also any suggestion whereby the work of the County Farmers' Institutes may be strengthened and improved.

ILLINOIS ASSOCIATION OF DOMESTIC SCIENCE.

This association is affiliated with the Illinois Farmers' Institute. It was organized by the Institute in 1898 to arouse wider interest in the science and art of home-keeping, and while not at all limited to the farm homes it is yet designed especially for the assistance of farmers' wives and to stimulate mutual helpfulness in their methods of housekeeping. The system of organization is precisely the same as for institutes, that is to say one association for each county working in conjunction with the county institute, and conducting at least one session of each annual meeting. Any number of local organizations may be formed and conducted upon any plan that is most convenient and helpful. The essential feature is the county organization working in connection with the county institute.

The State association holds one meeting a year in connection with the State Institute and the delegates to this meeting are the only members of the State association, except the officers. There are no dues or membership fees, except such as the local organizations impose upon themselves.

Each organization of domestic science is entitled to two delegates and it is hoped there will be a full representation. All clubs interested in the subject of domestic science are invited to send delegates and all persons are most cordially invited to attend these meetings.

The Illinois Association of Domestic Science has, in charge of Mrs. S. Noble King, of Bloomington, secretary, 120 volumes on Domestic Science and Household Topics, which are intended for the use of the domestic science clubs throughout the State. This is, perhaps, the most complete collection of books on these lines to be found anywhere. From one to three volumes may be drawn by an association or club and kept for a period not to exceed three months. One volume may be drawn by individual members of associations or clubs and kept for a period not to exceed two weeks. Express or postage will be paid both ways by the borrower.

Mrs. Joseph Carter, Champaign, president.

Mrs. S. Noble King, Bloomington, secretary.

The citizens of Bloomington and vicinity unite with the Farmers' Institute officials in extending a hearty invitation to the people of Illinois to attend this Eighth Annual Round-Up Farmers' Institute meeting and will do all in their power to make the visit pleasant and profitable to all visitors.

BLOOMINGTON'S PROMINENT POINTS.

Bloomington, a city of about 25,000, is located in the center of the greatest agricultural district in the United States, and ten divergent railway lines make it easy of acccess from any direction. It is a college town and the intellectual, conservative and religious spirit of the people make it one of the most pleasant places in the State to live. Bloomington has an excellent system of public schools; there is one high school, eleven grammar, three parochial and several private schools, with 5,000 pupils and 120 teachers; a commercial college, a college of oratory and a college of music. The Illinois Wesleyan Univesity, foundered in 1853, is located here; it has a faculty of 21 and an attendance of about 400 students. Located at Normal, two miles from the center of Bloomington and connected by electric railway, is the Illinois State Normal University, which has long been known as one of the best institutions in the Union for the education of teachers. Bloomington has 32 churches, including many denominations; and one of the best public libraries in Illinois.

Of special interest and instructive value to the institute visitors are the exhibits of the largest seed corn breeding establishment in the United States, and McLean county is the home of many men of large and long experience in the live stock business.

Among the diversified manufacturing interests are the mammoth shops of the Chicago & Alton railroad, which employ from 1,600 to 2,000 men. There are two furnance foundries and two stove foundries employing about 400 men; 75 people are given work in a medicine factory; 150 people are employed by one printing and stationery company and six others do a good business; 25 men are employed by one company in the manufacture of vinegar and packing of pickles; a canning factory gives work to many during its season and uses the product of about 300 acres. Bloomington has the largest nurseries in the State, comprising over 1,000 acres and necessitating the employment of about 600 persons; a caramel factory employs 250 people and many more find work in other candy factories; 75 are employed in an overall factory; there is a sunbonnet and hose-supporter factory; four wood working establishments employ 300 men; eight brick yards give work to 500 men and make 50,000,000 brick annually; one brewery employs 150 men; 18 cigar factories employ 500 people; the pork packing plant employs 150 men; two flour mills give work to many; builders and contractors employ 1,000 men; a coal shaft gives work to 500 men and hoists 700 tons per day; there are boiler works, large machine shops, marble works, gas factories, gate factories, two public heating and electric light plants, several of the largest warehouses and many of the best modern business houses. The wholesale grocers, farm machinery firms, flour mill, hardware men and mill-wrights operate in several states and are among the largest jobbers in Illinois.

Bloomington has six banks—three national and three state—with a combined capital and surplus of about $1,500,000, and deposits of about $4,500,000. Bloomington is the home of 300 commercial travelers. Bloomington newspapers are more completely equipped and cover the field more thoroughly than any other in the State outside of Chicago. The city has seven large hotels, four being new, besides several smaller ones. Bloomington has more miles of pavement and better shaded streets than any other city of its size; three large parks with the largest artificial lake in the State; a half-million dollar court house nearing completion; the largest private ownership convention hall in the State outside of Chicago—the coliseum where the Illinois Farmers' Institute will be held; more secret and fraternal orders than any other city of its size. The Illinois Soldiers' Orphans' Home is located within easy reach of the electric street railway, which is one of the best equipped in Illinois; there are over 15 miles of the different lines and by it visitors may reach the up-town hotels and institute hall from all the depots and Normal. The lines of railroad centering in Bloomington are: Chicago & Alton, main line and Jacksonville branch; Illinois Central, main line and Kankakee branch; Big Four and Lake Erie and Western.

A time table giving the arrival and departure of all trains can be found on the third page of the cover of this program.

Street car and bus lines run to all stations.

PROGRAM FOR THE EIGHTH ANNUAL ROUND-UP MEETING OF THE ILLINOIS FARMERS' INSTITUTE, TO BE HELD IN BLOOMINGTON, ILL., TUESDAY, WEDNESDAY AND THURSDAY, FEBRUARY 24, 25, 26, 1903.

The institute will open promptly on time with the class work, as indicated in the program, and if you wish to get the full benefit of the sessions you should be present at the opening each day from start to finish.

CLASS WORK.

Armory Building—Tuesday, February 24—9:00 A. M.

Corn Class—Subject: "Standard Varieties of Corn, History and Description." Score Card—Explanation and uses of. Judging work on pure bred varieties. Mr. A. D. Shamel, Washington, D. C., instructor.

Illinois Hotel—9:00 A. M.

Class in Domestic Science in Ladies' Ordinary—Subject: "How Shall Girls be Given the Help they Need to Become Good Home Makers." Mrs. Nellie Kedzie Jones, Berea, Ky., instructor.

Front Room of Coliseum—9:00 A. M.

Class in Horticulture—Subject: "The Orchard." Prof. J. C. Blair, University of Illinois, instructor.

Coliseum—9:00 A. M.

Class in Live Stock—Subject: "Market Classes and Grades of Cattle." Prof. Herbert W. Mumford, University of Illinois, instructor.

GENERAL SESSION.

Coliseum—Tuesday, February 24—10:30 A. M.

Chairman, J. H. Coolidge, Galesburg, President of Illinois Farmers' Institute.

Music, Soldiers' Orphans' Home Band.

Prayer.

Enrollment of delegates and appointment of committees.

Report of superintendent of institutes, A. B. Hostetter, Springfield.

Address to the delegates from County Farmers' Institutes on the management of Farmers' Institutes, George McKerrow, Madison, Wis., Superintendent of Wisconsin Farmers' Institutes.

COLISEUM—TUESDAY AFTERNOON—1:30 P. M.

Chairman, J. H. Coolidge.

Music, vocal duet, "The Huntress," Miss Lottie Durgy, Miss Bertha Stewart.

Address, "The Work of the Department of Agriculture, Washington, D. C.," Secretary of Agriculture Hon. James Wilson or his representative.

Reading, Miss Alma Widmeyer.

Address, "The Relations of Landlord and Tenant," Henry Wallace, Des Moines, Iowa.

Discussion led by James Frake, Chicago, Ill.

COLISEUM—TUESDAY, FEBRUARY 24—5:00 P. M.

CONVENTION OF DELEGATES.

The Convention of Delegates of the Illinois Farmers' Institute for the election of directors for the even numbered Congressional districts will be held in the Coliseum, Bloomington, Ill., Tuesday, Feb. 24, 1903, at 5:00 o'clock p. m.

The delegates from the several County Farmers' Institutes will meet at the above named time and place to elect directors of the Illinois Farmers' Institute for the even numbered Congressional districts. Only duly accredited delegates will be allowed to vote. Voting by proxy not admissible.

COLISEUM—TUESDAY EVENING—7:30 P. M.

Chairman, Mrs. S. Noble King, Bloomington, secretary of the Illinois Association of Domestic Science.

Music, Vocal Solo, Miss Minola Templin.

Address, "Home Making," Mrs. Ada F. Howie, Elm Grove, Wis.

Music, Vocal Solo, Miss Lizzie Baldwin.

Address, "The Work of the Experiment Station and the College of Agriculture, Dean Eugene Davenport, Urbana, Director of Experiment Station and Dean of the College of Agriculture.

Music, Vocal, Miss Josephine Smith.

The above music by pupils of Mrs. O. R. Skinner and Mrs. H. K. Roush.

CLASS WORK.

ARMORY BUILDING—WEDNESDAY, FEBRUARY 25—8:30 P. M.

Class in Corn Judging—Subject: "Corn Cultivation." A brief discussion of the methods; judging work with pure bred varieties, A. D. Shamel, Instructor.

THE ILLINOIS—8:30 A. M.

Class in Domestic Science in the Ladies' Ordinary—Subject: "Family Food. Balanced Rations for People." Mrs. Nellie Kedzie Jones, Instructor.

FRONT ROOM OF COLISEUM—8:30 A. M.

Class in Horticulture—Subject: "Small Fruits and Vegetables." Prof. J. C. Blair, Instructor.

COLISEUM—8:30 A. M.

Class in Live Stock—Subject: "Dairy Cattle." Prof. W. J. Fraser, Professor of Dairy Husbandry, University of Illinois.

GENERAL SESSION.

COLISEUM—WEDNESDAY, FEBRUARY 25—9:30 A. M.

Chairman, Joseph Newman, Elgin, President of Illinois Dairymen's Association.

Music, Instrumental, Miss Irene Seibel.

Field Work in Dairy Investigations, A. J. Glover, Elgin, Ill.

Discussion led by Mrs. Ada F. Howie, Elm Grove, Wis.

Testing Milk Demonstration, Prof. Oscar Erf, University of Illinois, Dairy Manufactures.

Music, Violin Solo, Harry Burke.

Some results of experiments to increase the productive capacity of different types of Illinois soil, Prof. C. G. Hopkins, Agronomy and Chemistry, University of Illinois.

COLISEUM—WEDNESDAY AFTERNOON—1:30 P. M.

Chairman, H. G. Easterly, Carbondale, Vice-President Illinois Farmers' Institute.

Music, Instrumental, Miss Ruth Kershaw.

Live Stock and Fertility, Prof. Chas. E. Thorne, Wooster, O., Director Ohio Experiment Station.

Discussion led by L. H. Kerrick, Bloomington, Ill.

Feeds and Feeding, Prof. H. M. Mumford, University of Illinois, Animal Husbandry.

Music, Violin Solo, Harry Burke.

Address on Horticulture, Prof. U. P. Hedrick, Agricultural College, Michigan, Horticulture.

Discussion led by Prof. J. C. Blair.

WEDNESDAY EVENING—7:30 P. M.

Chairman, Hon. Alfred Bayliss, Springfield, Superintendent of Public Instruction.

Music, Bloomington High School Orchestra No. 1.

"Teaching Agriculture in the Public Schools," Frank H. Hall, Aurora.

Music, Bloomington High School Orchestra No. 1.

Discussion led by Henry F. Thurston, Chicago, Secretary of School Officers Association of Cook County.

CLASS WORK.

ARMORY BUILDING—THURSDAY, FEBRUARY 26—8:30 A. M.

Class in Corn—Subject: "Corn Improvement—The Value of Good Seed and Means of Procuring it—Judging Pure Bred Varieties," A. D. Shamel, Instructor.

THE ILLINOIS—8:30 A. M.

Class in Domestic Science, Ladies' Ordinary—Subject: "Who Builds the Child's Character?" Mrs. Nellie Kedzie Jones, instructor.

COLISEUM.

Class in Horticulture in front room of Coliseum—Subject: "Ornamental Trees and Shrubs and How to Arrange Them in Public and Private Grounds." Prof. J. C. Blair, instructor.

Class in Live Stock—Subject: "Market Classes and Grades of Cattle." Prof. H. M. Mumford, insttuctor.

GENERAL SESSION.

COLISEUM—THURSDAY—9:30 A. M.

Chairman, J. H. Coolidge.

"Breeding Corn for Special Purpose." Prof. P. G. Holden, Ames, Iowa, Iowa Agricultural College, Agronomy.

Discussion led by Prof. C. G. Hopkins.

Music, Vocal Solo, Mr. F. O. Hanson.

"Cultivation and Uses of Grasses sud Forage Plants," Prof. F. B. Mumford, Columbia, Mo., Professor of Agriculture Missouri Agricultural College.

Discussion led by J. T. Foster, Elkhart, Ill.

DOMESTIC SCIENCE SESSION.

COLISEUM—THURSDAY AFTERNOON—1:30 P. M.

Mrs. Joseph Carter, Champaign, President Illinois Association of Domestic Science, presiding,

Music, High School Orchestra.

Secretary's report, Mrs. S. Noble King, Bloomington.

Address, "What Should Mothers Ask for in the School Training of their Children?" Mrs. Nellie Kedzie Jones, Berea, Ky.

Domestic Science in the Schools of Illinois, Joseph Carter, Superintendent of Schools, Champaign, Ill.

Pantomine—"Home, Sweet Heme," by children of District No. 84, Miss Daisy Troxel, teacher.

Discussion of Domestic Science in Schools:

1. How to put Domestic Science into the Schools, Alfred Bayliss, Springfield, Superintendent of Public Instruction.

2, The Training of Teachers in Domestic Science, David Felmley, President State Normal University.

General Discussion.

Music—Violin Solo, "Sixth Air De Beriot," Miss Josephine Brown, Bloomington.

THURSDAY EVENING—7:30 P. M.

Music, Bloomington High School Orchestra No. 2.

Address—"Social Progress of Rural Communities," Prof. Charles R. Henderson, Chicago, Professor of Sociology, University of Chicago.

Music, Bloomington High School Orchestra No. 2.

REPORT OF THE PROCEEDINGS OF THE EIGHTH ANNUAL ROUND-UP MEETING OF THE ILLINOIS FARMERS' INSTITUTE, HELD IN THE COLISEUM AT BLOOMINGTON ON FEBRUARY 24, 25, 26, 1903.

President Coolidge in the chair.

President Coolidge: The Institute will please come to order. I am sorry to announce that we shall have to dispense with the music this morning. We were to have the Soldiers' Orphans' Home Band but on account of sickness in the home they are unable to be present.

If the Institute will please rise we will listen to an invocation by Mr. Scott.

Reverend Scott—Let us look to God for a blessing. Oh Thou who art the Father of man and whose child man is, let us in the beginning of this Institute understand again something of the dignity and the worth and the grandner of man's life as it is conceived in the thought of our life, in that greater mind whereby Thou dost make the earth with all its beauty and glory and put man in the midst of it. We are the sons and daughters of God and let us know this morning that the earth does not control us but that we control the earth. Thou hast given us the beauty in the earth and the flowers and the music in the woods and in the streams that we may drink in wisdom at Thy fountains and look up into Thy face and say God, Father we thank Thee. We thank Thee for the men from the farm who have gone forth to fight for this nation, who have given up their lives bravely in the defense of their home and country. We ask for understanding as we seek to develop new ideas and apply them to the soil. It is because man has mind and soul from Thee that he can do this and we catch a foretaste of that glory which makes us understand we are to grow from grace to grace and never die. We are the sons and daughters of God and we bow humbly in Thy presence and we rejoice in Thee and glory in Thee. We see Thy handiwork in the treasures of our orchards and the harvest of our fields and in the glory of all our life round about us, and when our life is finished here may we meet Thee in the life everlasting. To God be the glory forever, Amen.

Chairman—The Credential committee will be found in yonder room in the corner, Mr. Hughes, Mr. Goodnow, Mr. Wilmarth and one other whose name I have forgotten. All delegates must present their credentials before they are entitled to vote. The even numbered districts elect their directors this year and the delegates elect them.

For the Resolution committee I will name, B. F. Wyman of Sycamore, Geo. W. Gale of Galesburg, Ed Grimes of Raymond, W. W. Cole of Geneseo, and A. M. Abbott of Union Grove.

It has been the practice for all resolutions to be handed in in writing to go before the Resolution committee. That practice will be continued during this meeting. There is one thing I want to say and that is, perhaps you don't all understand, the delegates appointed by the different counties to sit in this meeting are the Illinois Farmers' Institute. It is not the directors, it is not the officers—we are your servants. The delegates from the even numbered districts, as I stated before, will elect their directors this year and they will meet this afternoon for that purpose in different parts of the hall.

Delegate—Mr. Chairman I move all resolutions be referred to that committee.

Delegate—I second the motion.

Chairman— It is moved and seconded that all resolutions be referred that committee, all in favor vote aye, contrary no. Motion carried.

OPENING ADDRESS OF PRESIDENT J. H. COOLIDGE.

It affords me a great deal of pleasure to meet here this morning so many farmers from all parts of our great State. I have been connected with the farmers' institute since its organization, and what strikes me most forcibly at this time is the great progress which has been made in intelligent scientific practical farming during the years that have passed since that time. How many old theories have been exploded and dropped, and thanks to our college of agriculture and experiment station new methods which produce desired results have taken the place of the old ones. We have no more mixing our seed corn to raise larger crops, neither are our farm animals afflicted with hollow horn or wolf in the tail. In fact, we are just commencing to learn the first principles of agriculture; heretofore we have been soil robbers. One thing we have accomplished that we may all feel proud of, and that is we have the best agricultural college building in the United States, equipped it with the best corps of instructors and filled it with the brightest lot of students—farmers' boys—to be found anywhere in the world. It stands at the top, and we must keep it there. I often wish my father had been my grandfather, that I might be one of these students and be able to realize on this investment, that has cost the State so little and is more valuable to the State than we can possibly enumerate.

But I have said enough. Our program is filled with speakers, the most noted in their line in the whole country, who will give you more information during this meeting than any of us could learn in a lifetime of individual work on our farms. The meeting is now open. We want the fullest discussion on all the subjects, and don't forget the delegates here assembled are the Illinois Farmers' Institute.

President Coolidge—The next on the program is the report of superintendent of institutes, Mr. A. B. Hostetter:

REPORT OF SUPERINTENDENT OF INSTITUTES.

[A. B. Hostetter, Superintendent.]

Ladies and Gentlemen, Members of the Illinois Farmers' Institute and Institute Workers—It is a great pleasure to again meet you in convention assembled, and to be able to congratulate you upon the great work accomplished by your united efforts on farmers' institute lines since the last annual meeting at Rockford.

That we have made progress; that we have widened the circle of institute influence; that thousands of farmers have been inspired through the institute with a desire for better methods and better results in farm operations; that higher ideals have been established to work toward; that a strong sentiment has been created in favor of better schools and better homes; that an education on special agricultural lines is both desirable and necessary to the highest success in farming; that such special education can be obtained through our college of agriculture. All these things and more have been accomplished and demonstrated beyond a question.

Although much has been accomplished, it is equally true that there is much yet to be done.

Although those who attended the institutes are numbered by thousands, yet in the aggregate, comparatively few of the farmers in each county avail themselves of the farmers' institutes' great school of instruction. Those who do attend the institute are, as a rule, the more intelligent, progressive and successful farmers. We have yet to reach both by precept and by example that class of farmers who do not attend the institute meeting, those who cut down the average yield per acre of farm crops; who breed the scrub grades of live stock; who clog the market with inferior dairy products; who shake fruit from the trees and market apples in a bag; who go to the crib for seed corn at planting time; who mar the appearance and reputation of a community with unkept grounds and buildings and neglected fields; who impoverish the soil by poor methods of cropping; who are penurious in voting taxes for school purposes and who keep their children out of school on the slightest pretext; who sit around the village stores spinning yarns while their wives and children do the chores; all these are yet to be interested, helped, encouraged and educated on agricultural lines, before Illinois can attain that agricultural supremacy to which her natural resources and ability to reach the markets of the world justly entitle her.

Every county in Illinois has held one or more institute meetings during the year closed by this meeting.

At many of these institutes the halls have not been large enough to hold the people who wished to attend. I would like to tell you of many of the new ideas that have been tried by several of the counties, but prefer that the county officers who have developed these new features have the pleasure and credit of reporting them to us.

Neither will I anticipate the good things which Superintendent McKerrow will give us on institute management and what may be brought out in the discussion of his address.

I want to say, however, to those who are inclined to be discouraged at the seemingly small attendance at their institute meetings, that we cannot judge of the good an institute is doing by the size of the audience; we must consider the purpose the people have in attending the institute meeting, whether it be for instruction or merely for entertainment, remembering that it is not the number who attend the institute, but the number who take the lessons home with them and put them into practice that counts for the betterment of agricultural conditions. It is not the people who know how to kill the smut germs on oats but those who treat their seed oats for this purpose who add to the resources of the State.

The time devoted to institute work in each county is so short that you can not afford to devote any of it to entertainment. A song or short selection of music between subjects of a different character, for a rest period is admissible, but more than this should be avoided.

Under no condition should the farmers' institute be made a school of oratory, a school exhibition, or musical recital, and the expenditure of any of the State appropriation for such purposes is a misapplication of the public funds.

When you have good strong men with you as instructors, who know things that you would like to know and can do things that you would like to do, you should tap them for all they are worth while you have the chance.

The reports received by me from the presidents of county farmers' institutes for the past year show that the institute speakers have given almost universal satisfaction. The subjects presented have been more largely upon practical lines than heretofore and we are beginning to see results from the institute work.

I will give a few quotations from the answers of county institute presidents to the following question: "What evidence, if any, do you find that the lessons of previous farmers' institutes in your county have been put into practice?"

One reports "I find as a result of the institute increased yield of corn per acre. More intelligent interest in the breeding of live stock. A greater interest in the possibilities of agriculture and a growing desire for better methods."

Another, "I find that many farmers are growing clover, cows peas, soy beans and alfalfa as a result of the farmers institute teaching the value of leguminous crops as feed and fertilizers."

Another, "Farmers are paying more attention to maintaining the fertility of their farms."

Another, "Improvement in the quality of corn grown and the selection of more uniform types for seed."

Another, "To farm less acres and farm better."

Another, "Better seeding, better cultivation and better live stock in the county."

Another, "Good attendance and attention at institute meetings."

Another, "Vastly improved quality of corn and other grains and a more intelligent pursuit of farming'"

Another, "In horticulture there is more pruning, cultivating and spraying. The kitchen and fruit gardens become better every year."

Another, "A marked improvement in farm buildings and home surroundings, more flowers, better kept lawns and happier homes."

Another, and not from a dairy section, "An increase in dairying."

Another, "More interest taken in what is being taught in the rural schools."

Another, "No more straw piles being burned."

Another, "We see the results of the institute in the fine exhibits of fruits and vegetables and farm products generally and in the increased attendance at the institute."

Another, "More attention is given to the small things on the farm, to prevent waste."

Another, "There is an abundant evidence in the increased crops of those who attend the institutes regularly. Through these the neighbors will be influenced to do better."

Another, "A clearly marked increased interest among farmers, and business men, even, and a constant inquiry for better products. Indeed I can see a vast difference in the farms and homes and their surroundings, though it may be going too far to attribute all this to the institute."

I think I have given you enough to show the common sentiment of them all, these are taken from different parts of the State, there are many more of the same tenor.

This to me is the most encouraging sign of progress being made on institute lines; it is results we are after. Surely much seed has fallen upon good ground and will yield many hundred fold.

Many of the county institutes supplement the State appropriation for farmers' institutes with local funds, this is the right thing to do and the practice should be encouraged in every county.

There is something about the atmosphere of a farmers' institute where the farmers themselves contribute money, as well as effort, that is inspiring and invigorating. The dollar which counts most for success (in the farmers' institute) is the dollar given by the farmer. It carries with it a personal interest in the meeting, a personal investment, a personal desire for results and an enthusiasm that cannot be obtained, so well, in any other way.

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SECURE ONE OF THEM AT ONCE FOR SOME PLACE IN YOUR COUNTY.

Each one of the Illinois Farmers' Institute Free Libraries contains about fifty volumes. Five or more citizens of any community in need of books can secure the use of one of these libraries FREE for six months by filing application for same, endorsed by the President and Secretary of the County Farmers' Institute of the county in which the community is located. The use of the books to be free to all who will comply with the rules of the library. The only expense will be the express charges from Springfield and return.

For application blank and further information, address

A. B. HOSTETTER,
Secretary Illinois Farmers' Institute,
Springfield, Illinois.

The State appropriation should be regarded only as a starter, and an incentive for local investment in an enterprise of great value to the State and to the individual farmer who will take advantage of the opportunities the institute offers for instruction on agricultural lines.

DISTRICT CONFERENCES.

The district conference under the management of the director from each district is an important factor in the preparation of the institute work for the coming season. It sould mean more than fixing of dates for the county meetings and circuits of meetings. The delegates to these conferences should study the needs of their respective communities and go prepared to coöperate with the adjoining counties in selecting speakers and subjects which will be most helpful to the largest interests and the greatest number in the several neighborhoods. In arranging circuits the special needs of the communities and railroad facilities for the speakers going from one meeting to another should have more consideration than county lines. The district institute program should also be carefully considered at the conference with reference to having a representative from each county present at the district meeting.

FREE LIBRARIES.

The free libraries are constantly growing in popularity and usefulness. There are at present 151 of them in use and many applications for them waiting to be supplied.

Libraries have been sent to 79 counties and located at 315 places. The use of the libraries is not only giving the farm boys and girls a taste and desire for good literature but is interesting them in the farmers' institute and teaching them something of the pleasures, advantages and possibilities of farm life. These libraries are laying the foundations upon which many a farm boy and farm girl will be able to build a systematic course of home reading, study and home culture. The free libraries are stimulating the establishment of permanent ones, both of these will be valuable adjuncts to a correspondence school of agriculture which I trust will become a feature of the institute work and permanent department of the college of agriculture in the near future. The pamphlet containing the program of this meeting gives full particulars in regard to securing the use of libraries and I trust that each one will take a copy home for future reference.

SCHOLARSHIP IN THE COLLEGE OF AGRICULTURE.

One hundred nine students are at present in the college of agriculture of the University of Illinois on scholarships awarded through the Illinois Farmers' Institute for the two years beginning September, 1902. This is the total number of scholarships allowed the institute each year. Some of the boys awarded scholarships were afterward unable to enter the college and their places were filled by others. On this account a total of one hundred and thirty-two awards were made.

The interest in the college of agriculture is growing so rapidly that the demand for scholarships will be greater than the ability of the Institute to supply them. Under these conditions applications for scholarships to begin next September should be made early and every county should strive to fill its own quota. We hope to have the coöperation of every county institute officer and every public spirited citizen in having each county represented by a home boy in the college of agriculture next year. The enthusiasm with which the farm boys enter upon their studies and the glowing accounts they give to their friends and neighbors of the college work has stimulated others in their home counties to strive for scholarships.

Bringing a boy educated in the college of agriculture back to the farm is like inoculating the soil with alfalfa bacteria. He stimulates a healthy, intellectual growth and desire for better things among all he comes in contact with. His companions absorb from the college boy's atmosphere that which makes them want to develop their own resources and possibilities.

It needs no hot house and pot culture to prove this, but free association of the boys, as they mingle in the work of the fields and the home, will demonstrate it.

It continues to be a source of satisfaction to all who have to do with the awarding of scholarships at first hand, that the college of agriculture will accept the boys just as they come from the farms with such preparation as they have been able to secure in the country school and by their own individual efforts.

We hope that the college will continue to waive all examinations for admission till the standard of the rural schools shall be raised high enough to give the farm boy a high school grade.

Do not oblige the farm boy to take the first step away from the farm by taking him away from home to secure high school advantages in some town. To do this is to diminish the chances of his ever going to the college of agriculture or of making farming his life work.

After following some of our boys from the college back to the farm I am more convinced than a year ago that as soon as it becomes generally known that a course of study, be it a long or a short course, at the Illinois college of agriculture will increase the earning capacity of its students, there will be no lack of agricultural students; young men and women, too, who will make farming their life work, and who will make their education a life work, who will become conspicuous examples in their several home counties of the benefits of scientific knowledge and scientific methods applied to farm and home work, such young men and young women will build up the rural schools, improve the social sphere of the country community and develop and sustain the resources of the farm, and while accomplishing these results will attain a degree of intelligence and culture which will place them in the highest rank of citizenship.

INTERESTING THE BOYS.

The Illinois Farmers' Institute has authorized a distribution of packages of pure bred seed corn to the several counties to be grown by boys under 18 years of age for exhibition at the home county farmers' institute.

The seed for this purpose is donated by the members of the Illinois Seed Corn Breeders' association. The boys will be asked to furnish with their name and address four cents each to pay the postage on the corn. If by this means we can interest the boys in all the counties as they have been interested in some counties which have tried this plan of corn growing, it will mean much for the boys, much for the county institute and much for the improvement of the corn grown in Illinois. A letter outlining this plan has just been sent to all county institute officers and to county superintendents of schools asking their co-operation in the work.

I ask the privilege of printing as part of this report some details of the county institutes, free libraries and scholarships which you will not care to have read at this time.*

This report would not be complete, however, without public acknowledgement of the generous support given to the institutions of the entire State by the newspapers of the several counties and the distinctly agricultural papers. The liberal publication of the institute proceedings and papers multiplies the institute audiences many times and reaches hundreds who would otherwise never hear of the farmers' institute.

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* See appendix for plan of corn exhibition at county institutes.

Too much cannot be said in favor of the agricultural press as an ally to the farmers' institute, our college of agriculture and the experiment stations. They extend the work of the institute throughout the year and keep the farmer from forgetting those things which he should put into practice. It requires skilled workmen, clear thinkers, faithful collectors and recorders of facts and liberal views to edit a reliable up to-date farm paper. Papers published by such men are worthy all the patronage that the farmers can give them and the hearty endorsement of the farmers' institute.

The domestic science associations are proving valuable helps to the county farmers' institutes. Their work has mostly to do with the home, its protection, its environments, its comforts, its happiness. What greater work can we engage in than that of home making and home keeping?

The home, the object of our constant care and most tender solicitude. Let us therefore encourage and assist the domestic science associations in every possible way. Their work applies alike to the betterment of all homes but our interests are given more especially to the farm homes which more than any others are the abiding places of liberty, comfort, happiness and good cheer. The places where the life giving and life sustaining principles of fresh air, ozone, sunshine, industry and the soil can be bred into the human family.

President Coolidge—I now have the pleasure of introducing to you Mr. Geo. McKerrow, of Madison, Wis., the superintendent of the Wisconsin Farmers' Institutes. He knows lots more about it than we do because he has been at it longer.

Mr. Chairman, Ladies and Gentlemen—I do not remember the subject assigned to me and as the president didn't name it I shall go as I please.

The management of farmers' institutes under the system followed in Wisconsin is different from that of Illinois. I might say conditions are also different.

Beginning at your northern boundary it is very much like northern Illinois but as go on northward from our southern line to the border of Lake Superior we find conditions in our state gradually change. Still the object of the farmers' institute whether in Illinois, Michigan, Minnesota, Southern Wisconsion, Central Wisconsin or Northern Wisconsin, may be said to be the same. The object of the farmers' institute wherever it is as I understand it is this, to make better homes, and that means better farms to support and sustain those homes, and that means better farmers, better farmers' wives, and sons and daughters.

And in a general way we can discuss the management of the farmers' institute not only from the standpoint of Wisconsin but from the standpoint of every state in the Union. In Wisconsin we have what may be termed a stronger central organization, but at the same time we have to have the local organization. No matter how good speakers we may select, how well the meetings may be directed by the presiding officer, if the people are not there then our ammunition is wasted, so the local organization is a very important one. For the local organization of Wisconsin as well as here must attend to the advertising, must work up the proper spirit in the community. Everybody must be talking about the farmers' institute. Every newspaper that reaches the farmers' home within the county and if possible every agricultural paper should for two, three and four weeks previous to this institute be discussing it and thereby interesting the people.

Now as to the local organization our experience teaches us this, that where any jealousy springs up, where politics are brought into the local organization or differences in religious creed or social feuds or anything that stirs up the animal in man, there is a damage done us. When a local organization is to be perfected to get the best results at your institute select your most energetic, your best working, your most interesting men and women for your committees for working officials and then you have started on the right road to a successful institute. We find that where the farmers not only interest themselves but also interest the business men of the town in which the institute is to be held that you get the best meeting. Now the business men in the town where the farmers do their trading I think all appreciate the fact that they depend on the farmers and if properly handled they will very soon put their shoulders to the wheel and help to make a success of the farmers' institute. We find in Wisconsin that they are very ready not only to help in securing the funds to defray the expenses of the hall, advertising, local advertising, and of offering a small prize list for the products of the farm and the farm home. We always find that these business men are always at the head of the list with the largest donations. Then after making the donation they are the best men in the community to talk up the institute, with the farmers and the farmers' wives. When they are buying goods they remind them of the institute and the institute dates and urge them to be in attendance. And when all work in harmony, farmers and business people we are always assured of a good attendance no matter if the mercury drops to 30 degrees below zero. It does that in Wisconsin. I presume it never does in Illinois.

Chairman—No, sir; oh no.

So much for organization. Another very important matter with us, and I presume with you, is to secure the proper speakers to present their subjects in a proper manner. I find in my experience of some ten years in managing institutes in Wisconsin that these speakers are discussed not only at the institute but before institute opens. People read the programs in the paper or the printed program in their hands and say: Who is this gentleman? Where does he live? What does he do? Is he practical? If he talks on the dairy products, they want to know if he milks cows and makes butter and cheese. If he talks on feeding stock: Has this man fat stock? If a lady that attends the institute talks about gardens, the question is, does she know anything about gardens. Has she ever grown plants? If about poultry, does she know anything about poultry. If she is to talk about the home they ask, does she preside in a home.

I once heard a lady read a very excellent paper upon the "Rearing of Children" and an old schoolmaster, when others were coming around and complimenting her work, arose and said, "That is excellent theory, madam. How many children have you raised?" She didn't answer, because she was a school mar'm somewhat in years. Yes, people are anxious to know if the speakers are practical. So in selecting speakers I am ready to say the hardest job is in getting a class of speakers that in the first place will inspire confidence in the audience that they are addressing. Then in the second place those who are able to tell, sometimes not in good English, but able to tell in such a way that people can understand what they have done, why they have done it so and thus and what success they have had from following the methods. They must in Wisconsin be practical; and more than that, to be successful institute workers with us, they must have the ability to convince us, to condense and boil down. We find in a two days' institute there is no time for long drawn theoretical talks. We prefer a ten minute talk to a 40 minute talk. We prefer very much a 20 minute talk to an hour's talk and then we prefer to have the audience do a great deal of talking. We prefer to have some time to give the audiance a chance talk back. My good wife sometimes says to me, "Before you went out to attend farmers' institutes I could talk half the time (I sometimes thought she talked a little more) but since you have been practicing on the people of Wisconsin, I can't get a word in edgewise and I advise you to stop and let the people talk back," and we find it is practical. We find the discussion the best part of the institute, and, therefore, we must have a speaker who can answer questions. That is the first requisite in selecting a speaker in Wisconsin, the ability to answer questions briefly and to the point.

To be sure our speakers are of the right sort, that they pay their honest debts in good times and whether they know thier business, are practical and respected in the community in which they live, I am asked by the committee to visit the farm of every worker and the locality in which he lives and pry into his business pretty deep to find out if he is all right. Perhaps we look after this in Wisconsin more closely because unfortunately in the early years of the institute we had some men going out among the farmers that didn't do these things and the report followed them from their home towns all over the state and these injured not only the gentlemen in question but the institute work in general. The choosing of the speakers is one of the most particular jobs, one of the things that have to be looked after the most carefully.

Another thing that we find very essential is the selection of gentlemen and ladies who can adapt themselves to the conditions that they meet in different localities, and whose experience is such that they can adapt themselves to the conditions that they find as they vary from one part of our State to the other. In certain districts you will find the potato industry carried on in every direction, in other districts beef cattle, some small amount of dairying, in others horses, in other districts horticultural and so we have to adapt the speaker to the existing conditions in each place and make our programs deal largely with what is being done in all the different portions of our State.

Now, Mr. President, I didn't undertake to set out to give you an hour's talk, but if your people will talk back probably we can spend the hour.

Chairman—This subject is now open for discussion and we want it fully discussed, that is all we have on the program.

Mr. McCarthy—Supposing you have a lot of farmers in your local institute how are you going to interest the farmers when they are there so they will come back?

Mr. McKerrow—By giving them the very best and most practical instruction applicable to the conditions in that locality, by keeping the meeting moving lively while it is being held.

One of the speakers is the chairman of the committe, that is of the day session. He is supposed to guide all the discussions into the proper channel, to see that every question is to the point and to call down any gentleman who gets away from the question. He is sort of a tyrant although we have five corps of workers in our State who do this work.

Chairman—How many to the corp?

Mr. McKerrow—Two regular men to the corp, an assistant and conductor and they are chosen to cover as wide a field as possible. If one is a clover and silo man the other man will be selected because he is something else, probably a beef man or a hog man so as to cover as wide a field as possible. This conductor is also chosen because he is a good man to hold the reins and takes the place of a presiding officer.

Mr. McCarthy—He is presiding officer when practical discussions are on.

Mr. McKerrow—That is what is intended.

Mr. ————Over how much of the State?

Mr. McKerrow—They are sent all over the State. The five corps. This week we are holding five two day meetings on Tuesday and Wednesday. These five corps are placed comparatively close together so that I can move the extra men rapidly between the corps. These two men stay at a meeting two days and we get on an average two extras or sometimes three to attend this meeting, sometimes four if it so happens.

Mr. McCarthy—They become professional institute workers?

Mr. McKerrow—Yes, sir.

How do they get their license, how do you qualify them?

Mr. McKerrow—We select the men and recommend them to the farm committee of the board of regents, and they pass on my recommendations, then these men are hired same as these regular conductors and assistants, expert poultrymen, expert horticultural speakers, expert horse breeders and under the different titles.

Q.—Wouldn't that have a tendency to reduce the number of local workers? Don't you find it difficult to develop persons in their respective counties to work?

Mr. McKerrow—We ask every institute committee to send in the name and topic of from three to five good local workers and sometimes we get the names of ten, and it is a hard job to select the best in the ten, but as a general rule they send in the number asked for, but in many cases they write us, "our people all refuse to go on the program; they prefer to listen to the people you will send." The people are well acquainted with our speakers, they have either heard them or heard of them and therefore it is pretty hard to get many local workers, but it is from these local workers that we keep adding to our institute force.

Mr. Easterly--How do you get at the selection of subjects?

Mr. McKerrow—We ask a local committee wherever an institute is to be placed to name to us at their convenience the subjects they would like to discuss and we send men most acquainted with the subject.

Mr. Easterly—In our plan in Illinois we get a wider range. We are American people and we like to have our own way.

Mr. McKerrow—Yes, sir, in speaking of the two plans, in our system we aim to allow the largest latitude, some think that personally I allow localities a little too much latitude, but I think it meets with general approval to allow the local organization to use their own ideas a good deal in the make up of their institute, although the placing of men has to be left entirely with the office, because one man might be called for at five of these different places on the same date. I put him where I think his work will do the most good Of course, I think our office knows about the conditions of the State, because every conductor keeps a blank report and he reports about the industry followed in that locality, he reports upon the soil, he reports upon the amount of interest, in fact we try to cover the whole field so by turning to the records I get an idea, but I spend practically all the time myself. I go as an extra man half a day or a day in a place and I think I have the conditions of the State pretty well in mind, but I believe there are some most excellent features about your plan. When we strike an American community where they meet and have a farmer's club or a grange they need very little looking after. Where they are foreigners they want us to attend to it.

In every town and every village of any size now they want an institute, and when we get into some foreign communities when they begin to get ready for the institute they are at a loss to know what to do, because they have had no practical experience.

Mr. Easterly—I would object to somebody coming and presiding over our meeting.

Doctor Berry—As far as I have seen the work in this State the people who ought to be out are not there; how are you going to reach them, the tenant farmers, how are you going to get at them?

Mr. McKerrow—That is a very important question, a question that is bothering every institute, whether local or State. How to get the rank and file out. I include the hired man and the tenant farmer's wife and the tenant farmer's sons and daughters. One of the best methods of getting them in is to offer a few prizes, small prizes, don't offer large prizes, a few small prizes covering just as wide a range of the products of the farms and farmer's homes as possible. Then more of these producers will come in with their products. It requires a little encouragement locally. These people must be talked to and told that there is a chance to win 50 cents on a half a bushel of oats and tell the farmer's wife that she can make a loaf of bread that perhaps will win a prize, or a cake, and her daughter under 15 can win a prize for baking a loaf of bread and in covering a wide range and bringing out the young people and offering some prizes for the young people specially we find a great deal has been done. I can't do this because I don't reach the people locally, but every institute worker can do something by shaking hands and giving a kindly word to these people. You, retired farmers take care of yourselves; I don't care to spend half an hour talking to them, they all come to the State Fair and I can spend time with them there. I want to get down with the people who are working the soil. All of our institute workers are asked to make a special point of this, to get right down among the people. The man who walks off to the hotel is not a good institute worker, but we find in doing the other way they will come again and bring their friends and the coming in will be gradual.

Mr. Bindman—Would it not tend to help the case if the farmers and land owners made it possible for a long tenure on the farm instead of a short one? The land owner goes to town and abandons the farm. Now as a matter of fact it seems to me that the farm ought to be the home of somebody instead of a stopping place and we should have the farm the home of the tenant. If he cannot own it outright, and I don't blame any farmer for not wanting to sell his farm, he should have it on such terms and for such time as would give him a home feeling, and the land owner should get over that predicament that he has gotten into, the idea that anything is good enough for a tenant. There are good tenants, faithful tenants, competent tenants who for good treatment and good homes will pay dividends to the owner.

Mr. McKerrow—Right along the gentleman's line of thought I will say that I had my eyes opened and my ideas materially changed since I have come across tenants who have been working the farms they are on for 20, 30 and 40 years and they take an interest in the condition of the farm, and the building and surroundings just as much as if they owned them, and I found upon making inquiry that that class of farms were paying far better than the class of farms they had in some places with the moving tenantry.

Mr. McCarthy—You also found the law providing for the long tenancies?

Mr. McKerrow—Yes, sir.

Mr. Bindman—Let me ask another question. It has been my observation that we have in my country farmers that know all about clover and all about corn and if there was a demand made today for horses from the farmers of the United States they will provide the world with horses in a few years or with cattle, hogs and sheep. They know how to produce them, the fellows that can produce the horse, the hog and the steer—it is very often the case—but while he is a success at that he is not a success at telling how it can be done. He can do it but he can't tell how, and we have another class of fellows who are glib with the tongue and can keep an audience from going to sleep, but he really don't know as much about it as the other fellow; which of the two is the best institute speaker?.

Mr. McKerrow—The one that knows it.

Chairman—They will learn how to tell if you give them a chance.

Mr. McKerrow—Our conductor asked one of the most successful silo builders, to talk on the subject, but he said he couldn't tell anything. If you engage him in conversation he could talk scientifically on the subject, so the conductor first called him up in his seat by asking questions and he could answer very readily, then he was asked to stand up, then come to the front and he didn't catch on how they were developing him into a speaker and before he knew it himself he was talking about the subject and making extended talks.

Mr. ——— —That is the way we started our man Cobb and now he talks for a week.

Mr. Coles—Don't you believe more good can be accomplished by having the county institute in the smaller towns rather than the larger towns? I think we have more success where the institutes are held in the smaller places and come in direct contact with the people interested.

Mr. McKerrow—It is a good point you are making. Formerly in institute work in Wisconsin we took the centers where we could get the large crowds, but today it is the small towns. That is one thing a little in favor of our system, that we can discriminate, otherwise a large town would usually win out. Some of our very best institutes are held right out in the country where they have a town hall or a grange hall and the farmers open their homes to make hotels, and I think we have held our very best meetings there.

Mr. Coles—If you have one institute there you can get all you want afterwards.

Mr. McKerrow—Yes, sir.

Mr. Hostetter—Do you have full liberty in selecting your speakers, or are you restrained in any way?

Mr. McKerrow—We can get them from where we please, my judgment directing that they should be from our own state. We do bring speakers from the outside sometimes at great expense, but they are not conductors. They are extra men. We do this to give the people the benefit of their experience in some other state and also to give our conductors and workers the benefit of these men's experience in institute work. We find it helps the men a great deal. Those are our two aims.

Mr. Kellehar—In the districts of Wisconsin do you leave the management to the officers of the county or do the state officers control it?

Mr. McKerrow—We work together. We work on their suggestions as far as the program is concerned but we control it. If a certain man is asked for and he can't be at that point he is not there, but we meet their requests as far as possible.

Mr. Kellehar—I attended two meetings this year. At one we didn't have any officers, we had an exhibit of over 60 loaves of bread and I don't know how many rolls of butter we had—all the farm products. We didn't have any county officers or State officers, but the old hayseeds got together and we had one of the best meetings I have ever attended. I was up at LaFayette and there the farmers came in and the people say, "What brought you to town?" "I came to the institute." "What institute?" "The farmers' institute." "I didn't hear anything about it." The hotels and the merchants tell you they haven't heard anything about it. But I am here to tell you the institute is what we make it. It makes us know each other better, love each other better and honor each other more. I have learned more from Brother Coolidge (he wouldn't tell a lie, but he makes awful mistakes sometimes). My neighbor says to me, what are you doing down there? I wish I was down there and I could tell them how mean you are at home. There is no use preaching what we don't practice at home. The trouble is, you tell the people what you don't know. Be very careful in telling only what you do know, and I tell you today that this instute work is one of the greatest schools that we have for ideas. We have learned a great deal and I say let us not do anything to weaken the institute, but let us make it stronger.

Mr. McKerrow—You would make a good institute worker.

Mr. Coolidge—He is a good one.

Mr. Goodnow—Do you favor offering premiums for the purpose of increasing interest and attendance, and in offering premiums would you go beyond the farm products and pantry stores into livestock?

Mr. McKerrow—That has been done at certain points in our State. Sometimes quite a large list of prizes for livestock and when properly conducted and their stock only on exhibition at certain hours, it has proved quite desirable, but sometimes it has been so large and absorbing that it has affected adversely the work of the institute. In one case it was very large where they had $2,200 in prizes for all kinds of exhibits including livestock and it took so long to get through the judging it ran into the institute. Still I don't know as it is altogether a failure as it stirs up the interest of the people and that is one thing we are after. In some towns we have held institutes and the town people didn't know there was an institute on and evidently the country people did know either and then they write us "Why is it we can't have another institute in this city, you have turned us down and we want an institute?" I said simply because we waste time when we go to your city, you don't get the farmers. And then they say our farmers are troubled with the big head; that they have made money and they think you fellows can't tell them anything. I could hardly agree with them and I knew that at some of the previous meetings it had slipped their mind. I suggested to the committee from the town that if they still wanted an institute to put up a few hundred dollars in prizes and advertise it and I would agree to try them onee more. They agreed to do it and called a meeting of the Business Men's Association, appointed a committee of two for each street in the city to solicit funds from the business men, and they went out telling the business men they didn't want a large amount but a small subscription, the first year they got $1,300 and the second $2,200. Business men who wouldn't subscribe the first year were anxious to be the first subscribers the next year. Instead of having people by the dozen we had them by the hundreds. It was just like a fair. A large ring was filled and the street was ranged up with teams for several blocks. Twenty-five and $40 were the first prizes and that was a little too big. If you have an exhibit hall and have hours from 11:00 a. m. to 2:00 p. m. I think it would work very well.

Mr. Goodnow—The best system of advertising?.

Mr. McKerrow—In the first place the local press must be used and used freely. In some places they print the matter without any charge as a matter of news. Print your programs and sell the advertising space. We send out 100 posters to people that we know within a radius of 12 to 15 miles. We sent about 50 that way and 50 direct to the local committee, and where they are interested they print more posters of their own, sometimes having cloth banners strung across the street. Then the programs, we send out 300 printed programs. We get out a booklet of this nature with more or less advertising that pays for the printing, and that interests the merchants and they talk to their customers about it.

Mr. McCarthy—Do you have domestic science association?

Mr. McKerrow—For the last ten years we have.

Q.—Do you find that a dinner is a good advertising agency?

Mr. McKerrow—Our domestic science don't set their dinner at dinner time. They have a lunch in the afternoon. They catch us that way and I don't presume their "tastes" would last very long.

Mr. Mann—What is the expense of holding institutes your way?

Mr. McKerrow—In Wisconsin $12,000 is expended annually in the farmers' institutes. With the $12,000 we are now holding on an average of about 100 two day meetings in the winter, one three day meeting called our round-up, similar to this meeting, and about a dozen one day summer meeting held in the month of June. Where the people are harvesting logs and cord wood in the winter, and 11 or 12 cooking schools held in connection with our winter meetings making all told about 125 meetings. In some cases they hold strictly a local institute, in place where they can't get a state meeting. We publish 60,000 copies of a report, a book of 320 pages, made up of different topics and discussion held at our closing institute and edited by the speaker. Probably some of you have had the 320 pages, but about 40 of them are taken up by advertising matter. That helps to some extent to pay the expense. That looks like a very large edition but the edition of this year is practically exhausted. We get requests from cheese factories, from business men and farmers for one, 50 or 100, and from school teachers since we have started domestic science in the schools. Now it costs us all told for this round-up meeting, printing and all the other expenses $6,000 in round numbers, so we have $6,000 left to hold the 100 or 125 meetings and what comes in from advertising. We advertise on the cash basis so that probably $8,000 is used in holding the 125 meetings. Then, of course, this local expense, premium list and hall rent in most places cost us nothing; most places they get the halls by paying heat and light and in large cities and county seats they get a court room.

Mr. Thurston—Are there any permanent local institutes in Wisconsin?

Mr. McKerrow—No, sir.

Mr. Thurston—Are there any that keep up the organization from year to year?

Mr. McKerrow—Only a few and these are the places where they hold them locally.

Mr. Thurston—They are not included in the 125?

Mr. McKerrow—No, sir.

Chairman—We will have to close this now and I hope we have all learned something· We will stand adjourned till 1:30 p. m.

Chairman—We now stand adjourned to 1:30 p m.

Convening of institute at 1:30 p. m.

Chairman—The institute will please come to order.

We will be entertained for the first number by a duet by some farmer's daughters.

Vocal duet "The Huntress," Miss Lottie Durgy and Miss Bertha Stewart.

Chairman—It affords me a great deal of pleasure, ladies and gentlemen to be able to introduce to you a member of the Department of Agriculture at Washington. The department is comparatively a new one but it has done a wonderful work since it was first organized and this is perhaps the first opportunity we have had of getting a report of what is going on there. We have had some representatives from there here but they have not been able to give us a clear idea of the work they were doing, Mr. Beal:

LADIES AND GENTLEMEN—The United States Department of Agriculture at the present time employs some 4,000 persons and is spending annually nearly four and a half millions of public money. This shows you it is really a large institution, but it has been very seriously handicapped and has made very slow progress except in recent years. A better understanding of the work may be learned from a review of what has been done and I propose to give very briefly such a review:

THE UNITED STATES DEPARTMENT OF AGRICULTURE AND ITS WORK.

[By W. H. Beal, of the Office of Experiment Stations, United States Department of Agriculture.]

In the United States Department of Agriculture at Washington there are nearly 4,000 persons devoting their energies to the promotion of agriculture, at a cost to the country of nearly $4,500,000 annually. This great agency for developing the agricultural resources of the United States and holding agriculture in its rightful place beside the other great industries sprung from small beginnings and is a product of slow growth. A better understanding of the present aims and purposes of the department may perhaps be had from a brief review of its history.

HISTORY?

Although some attempts had been made at an earlier date, through the consular service of the State Department, to collect valuable seeds and plants in foreign countries for distribution in the United States, systematic work in the interest of agriculture under government auspices may be said to date from July 4, 1836, when the Patent Office was made a separate bureau and Hon. Henry L. Ellsworth of Connecticut was appointed Commissioner of Patents. Commissioner Ellsworth considered it within the proper scope of his office to help the farmers of the country by distributing seeds and plants. He had been a practical farmer in Connecticut, and, having traveled far to the west as Indian Commissioner, had been greatly impressed by the fertility of the vast prairies and was deeply interested in projects for the opening of these lands to settlement. He also realized the importance of the invention of improved agricultural implements, which were then beginning to attract public attention, and believed that great benefit might result from the establishment of a regular system for the selection and distribution of grains and seeds of the choicest varieties for agricultural purposes. The department began, therefore, as a division of the Patent Office, and its chief function was the collection and distribution of valuable seeds and plants, and, as will be explained later, this is still an important feature of department work. So earnest and successful was Commissioner Ellsworth in the prosecution of the agricultural work which he had undertaken to do that in 1838 Congress was induced to make a special appropriation for its maintenance, for it should be borne in mind that prior to this time the work had been done by this earnest pioneer in the cause of agriculture, without legal authorization and outside of office hours. The appropriation was at first very small, amounting to only $1,000 annually, and occasionally even this lapsed on account of the failure of Congress to appropriate. In 1855, however, the annual appropriation for agriculture was increased to $35,000, and has never since been less than that sum. A special agent was now employed "to investigate and report upon the habits of insects injurious and beneficial to vegetation, especially those infesting the cotton plant." In 1855 an arrangement was made with the Smithsonian Institution for procuring and publishing meteorological statistics. A chemist and botanist were also employed, and a propagating garden was begun. The annual report of Commissioner af Patents David P. Holloway of Indiana for 1861 is worthy of notice as the last and most complete agricultural manual issued by the Patent Office, and as containing a bold and able plea for the creation "of a Department of the Productive Arts, to care for all the industrial interests of the country, but especially for agriculture." Congress adopted a portion of the commissioner's plan, and passed a bill establishing a Department of Agriculture. This act became a law by the approval of President Lincoln on May 15, 1862, and on July 1 of the same year the new department was formally organized in the rooms of the Patent Office previously occupied by the agricultural division of that office. Though by the terms of the act an independent department of the government was established, its chief officer was styled Commissioner of Agriculture and was not a member of the President's cabinet. The duties of the department, as defined in this act, are: "To acquire and diffuse among the people of the United States useful information on subjects connected with agriculture in the most general and comprehensive sense of that word, and to procure, propagate and distribute among the people new and valuable seeds and plants." Hon. Isaac Newton of Pennsylvania, who had been, since early in 1861, the superintendent of the agricultural division of the Patent Office, was appointed the first Commissioner of Agriculture. Mr. Newton had been a practical and progressive farmer, was one of the first and most active members of the State Agricultural Society of Pennsylvania, and had for years urged upon Congress the importance of establishing such a department as that over which he was now called to preside. He at once proceeded to organize the department on a liberal basis, and under his administration and that of his successors the department steadily grew and extended its field of usefulness.

As the progress of agricultural science demanded new divisions of the work and the means at the disposal of the department enabled it to widen the range of its efforts, one scientific branch after another was added. In 1884 the Bureau of Animal Industry was established to investigate and report upon the diseases of domestic animals, especially pleuro-pneumonia, and to devise measures for improving the animal industries of the country. The bureau has since been charged with the inspection of import and export animals and of live stock and their products slaughtered for food consumption. On Feb. 11, 1889, President Cleveland approved the act of Congress to make the Department of Agriculture an executive department, and nominated Hon. Norman J. Colman of Missouri the last Commissioner of Agriculture, to be the first Secretary of Agriculture. His successors in that office have been Hon. Jeremiah M. Rusk of Wisconsin, Hon. J. Sterling Morton of Nebraska and the present secretary, Hon. James Wilson of Iowa, all of whom have materially extended the scope of the department and increased its efficiency. July 1, 1901, the Weather Bureau was transferred from the War Department to the Department of Agriculture, and since that date a number of divisions have been added and various divisions expanded into or combined to form bureaus.

ORGANIZATION.

As at present organized, the department contains, besides the offices of the secretary and assistant secretary and other purely executive officials, the following bureaus and divisions:

The weather bureau, which has charge of the forecasting of weather; the issue of storm, flood, and frost and cold wave warnings for the benefit of agriculture, commerce, and navigation; maintains and operates seacoast telegraph lines for the collection and transmission of marine intelligence; reports temperature and rainfall conditions for the cotton, rice, sugar, and other interests; and takes such meteorological observations as may be necessary to establish and record the climatic conditions of the United States, or as are essential for the proper execution of the foregoing duties.

The bureau of animal industry, which makes investigations as to the existence of contagious pleuro-pneumonia and other dangerous communicable diseases of live stock, superintends the measures for their extirpation, makes original investigations as to the nature and prevention of such diseases and reports on the condition and means of improving the animal industries of the country. It also has charge of the inspection of import and export animals, of the inspection of vessels for the transportation of export cattle, and of the quarantine stations for imported meat cattle; supervises the interstate movement of cattle, and inspects live stock and their products slaughtered for food consumption. It also makee investigations having for their object the promotion of the dairy interests of the country.

The bureau of chemistry, which makes researches in agricultural chemistry, especially on foods, sugar-producing plants, fertilizers, soils, materials for road making, methods of analysis, etc.

The bureau of plant industry, which conducts investigations in economic botany, on the physiology and diseases of plants, plant breeding, the natural history and geograpical distribution and utilization of grasses and forage plants; tests and propagates economic plants; studies varieties of fruits with special reference to their adaptability to various soils and climates; collects seeds and plants from foreign countries for distribution in the United States; purchases and distributes seeds, largely through members of Congress; tests the purity and vitality of seeds; and has the care and management of the National Herbarium, the department park and conservatories, and the Arlington Experimental Farm.

The bureau of forestry, which investigates the kinds of trees and methods of planting suited to the treeless west, gives practical assistance to tree planters, and also to farmers, lumbermen, and others in all parts of the country in handling forest lands. It studies the commercial trees to determine their special values in forestry, and also studies forest fires and other forest problems.

The bureau of soils, which is charged with the investigation, survey, and mapping of soils; studies in agricultural physics; investigations in curing and fermenting tobacco.

The division of statistics, which collects information as to the condition, prospects, and harvests of the principal crops, and of number, condition, and values of farm animals, in the United States, and also obtains similar information from European countries, and publishes statistics of agricultural production, distribution, and consumption for the information of producers and consumers.

The section of foreign markets, which makes investigations and disseminates information "concerning the feasibility of extending the demands of foreign markets for the agricultural products of the United States."

The division of entomology, which studies the life histories, habits, distribution, and means of repression of injurious insects.

The Division of Biological Survey, which studies the geographic distribution of animals and plants, and maps the natural life zones of the country. It also investigates the economic relations of birds and mammals, and recommends measures for the preservation of beneficial and the destruction of injurious species. It is charged with carrying into effeet the provisions of the federal law for the importation and protection of birds.

The Office of Public Road Inquiries, which collects information concerning the systems of road management throughout the United States, and conducts investigations and experiments regarding the best method of road making.

The Division of Publications, which exercises general supervision of the editing, printing, illustration and distribution of department publications (except those of the weather bureau).

The Division of Accounts and Disbursements, which has charge of the financial business of the department.

The Library, to which is entrusted the care of the department library of 70,000 volumes, the arrangement and cataloguing of books, and the preparation of bibliographies and similar publications.

The Office of Experiment Stations, which represents the department in its relation to the experiment stations. This office seeks to promote the interests of agricultural education and investigation throughout the United States. It collects and disseminates general information regarding the colleges and stations, and publishes accounts of agricultural investigations at home and abroad. It also indicates lines of inquiry for the stations, aids in the conduct of co operative experiments, reports upon their expenditures and work, and in general furnishes them with such advice and assistance as, it is believed, will best promote the purposes for which they were established. In a similar way it seeks to aid in the development of the farmers' institutes throughout the United States, as will be explained later. It is charged with investigations on the nutritive value and economy of human foods and on irrigation, drainage and allied subjects.

GROWTH OF THE DEPARTMENT AND OF THE AGRICULTURE OF THE UNITED STATES.

The growth of the department, although very slow in its early history, has been very rapid in recent years. This rapid growth is in a sense representative of the development of the agricultural interests of the country and testifies to the need and the wisdom of fostering those interests. In concluding his last annual report, Secretary Wilson says on this point:

> In the industrial progress made by the United States during recent years there has been no more conspicuous feature than the growth of agriculture. It is doubtful if the magnitude attained by our farming interests is generally known. According to the reports of the twelfth census, the fixed capital of agriculture, comprising the value of the land, buildings and improvements, of implements and machinery, and of live stock, amounted in 1900 to about $20,000,000.000 or four times the fixed capital invested in manufactures. During that year there were nearly 5,740,000 farms in the United States, covering an area of 841,000,000 acres, of which 415,000.000 acres consisted of improved land. These farms had a total value of $16,675,000,000, exclusive of farming implements and live stock. Farm implements and machinery formed an item of $761,000,000, while the value of the live stock on farms exceeded $3,000,000,000.
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> As further indicating the importance of agriculture in the United States, it is a striking fact that, according to the returns of the last census, about 40,000,000 people. or more than half of our total population in 1900, resided on farms. Of the 29,000.000 persons comprising the portion of our population engaged in gainful occupations, about 10,000,000, or more than a third, were returned as employed in agricultural pursuits. The people that work upon the farm outnumber by more than 3,000,000 persons those who are occupied in the manufacturing and mechanical pursuits.
>
> In 1899, according to the census returns, the produce of American agriculture, including farm animals and their products, had an aggregate value of nearly $5,000,000,000. Some of the crop values that make up this total were almost startling in their size. The crop of Indian corn, which formed the leading item, had a value of $828.000,000. The hay and forage of the census year were worth $484,000,000. Wheat, which ranks next to corn among our

cereal crops, gave a return of $370,000,000, while oats were produced to the value of $217,000,000. Cotton, the great crop of the southern states, was valued at $324,000,000.

In addition to these foremost crops, there were numerous others yielding returns in value that ran into the millions. Live stock and their products formed an exceedingly important factor in the grand total. The animals sold and slaughtered during the year were valued at above $900,000,000. The several products of the dairy—milk, butter and cheese—comprised an item of $472,000,000, while poultry and eggs together brought a return of over $281,000,002.

"As a result of the intelligent application of improved methods to American agriculture, the produce of our farms has enabled us to increase the volume of our exports every year. Products of agriculture form about two-thirds of our entire export trade. Last year the exports from the farm amounted to $860,000,000. The science of agriculture is in rudimentary stages in all lands. The education of producers from the field, so long neglected, has recently been undertaken in earnest in the United States. Our government is doing more for the farmer than all other nations combined. Results are justifying expenditures, and the future will still further show the value of science applied to the farm."

WORK OF THE DEPARTMENT.

This last sentence furnishes the keynotes of the inspiration of the department work, viz.: The application of science to the farm. Aided by generous appropriations and guided by able executives, the department has grown from a mere agency for the collection and distribution of seeds and plants to be the largest single institution in the world for the promotion of agriculture by scientific methods. The department and agricultural colleges and experiment stations, which are now established in every state and territory, and in Alaska, Hawaii, and Porto Rico, form the most complete system of agricultural education and research in the world. The work of these institutions is firmly establishing agriculture in the ranks of the sciences; but it is doing more than this. It can and does furnish practical help in the daily business of farming. Considering the subject from this standpoint, the question naturally arises. What is the Department of Agriculture and associated institutions doing for the American farmer that is of direct benefit to him in his business? In attempting to answer this question it is impossible to draw a sharp line of distinction between what has been done by the department on the one hand and what has been accomplished by the agricultural colleges and experiment stations on the other, since the relations between these two agencies are so close and the lines of work to such a large extent identical that, as already stated, they form one great system of agricultural education and research. The department maintains close relations with the agricultural colleges and experiment stations through its office of experiment stations, and there is an evident disposition on the part of Congress to promote such relations by providing in its appropriation acts for an increasing amount of coöperation between the two.*

Evidence that the influence of the work of the department and the associated agricultural institutions is improving agricultural practice and benefiting the farming interests of the country is being felt in all the various phases of agricultural operations is too abundant to be fully recounted within the limits of this paper. I shall therefore attempt to enumerate only a few of the results of this work which seem to have a very direct and practical hearing.

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* A considerable amount of coöperative work is being done by the Department and the Illinois Station.

INTRODUCTION OF NEW AND VALUABLE CROPS AND METHODS OF CULTURE.

There is no doubt that the department, even in its early days when its activities were largely confined to the collection and distribution of seeds and plants, did much to help the agriculture of the country, as one of many notable examples will suffice to show, viz.: The introduction of the naval orange into this country from Brazil in 1869. By far the larger proportion of the oranges grown in California is of this naval variety.

As the department has developed, this feature of its work has been systematized, and more intelligently directed, until the department now has agricultural explorers in all parts of the world searching for valuable plants which may be transferred with profit to this country. That much of value may be accomplished in this way is shown by a few of the more important results already attained.

Kafir corn, imported and distributed by the department in 1886, has proved a valuable crop, especially in regions subject to droughts too severe for the successful culture of corn. It is reported that the value of the crop in Kansas alone is over $6,000,000 annually.

The so-called Swedish oats, imported by the department and tested, improved and distributed by a number of the experiment stations, bids fair to greatly increase the yield of oats in the regions to which it is especially adapted. Professor Henry estimates that its general introduction in Wisconsin would result in an average increase in yield of three to five bushels per acre. This would mean a gain to the farmers of Wisconsin annually of $2,000,000 to $4,000,000 on the oat crop alone.

The macaroni wheats imported by this department and tested by the stations in the wheat growing region of the northwest have proved so successful that there is reasonable assurance that in a few years the United States will produce all of the macaroni it consumes, thus keeping at home about $800,000 which is now annually expended abroad for this product.

The Turkestan alfalfa introduced into the country by the department and tested by a large number of the stations has been shown to have qualities of hardiness and vigor which will enable it to withstand frost and drought to a greater degree than the common variety, and will thus still further extend the limits of profitable production of this valuable forage plant. The same causes which make Turkestan alfalfa so valuable have operated to a still greater degree in demonstrating the value of brome grass (*Bromus inermis*) introduced by the department for the dry and cold regions of the west and northwest.

Rice—Five years ago this country produced less than one-half the rice it consumed, and the rice produced commanded a low price because of its poor milling quality. The department sent a special agent to Japan to study the rice industry there. This agent brought back ten tons of a high grade Japanese rice, which was distributed to the rice growers of the south, with the result that the next year 100 tons of this rice was produced. The rice growers of the United States are now meeting the home demand, and will soon be able to export rice to foreign countries.

Among other valuable introductions by the department which can only be mentioned here are varieties of Egyptian cotton, which yield an especially valuable fiber and are more resistant to disease than those ordinarily grown; European grapes especially adapted to the warmer parts of the United States; and dates, which are proving a great success in Arizona.

Sugar Beets—Investigations with sugar beets have been conducted throughout the country by the department, with the co-operation of the state experiment stations and of practical farmers, with the result that there were in 1901 175,000 acres devoted to sugar beets, producing 1,685,000 tons of beets, worth to the growers probably $7,000,000, and yielding nearly 370,000,000 pounds of sugar, worth $12,000,000 to $14,000,000, which formerly went into the pockets of foreign sugar producers. There has thus been established within a dozen years, on a safe basis, a new agricultural industry of great importance to the country.

Tobacco—Work of a similar character has been done with tobacco. This has included not only the study and mapping of soils suited to different types of tobacco, but also tests of special methods of growing and curing some of the more valuable kinds, such as the high grade Havana and Sumatra tobaccos, which have been largely imported from abroad, or, when grown in this country by ordinary methods, are of an inferior quality and low market value as compared with the foreign product. It was found, for example, that a superior grade of Sumatra tobacco could be produced when grown under a shade of cheese cloth. This tobacco, which is the standard for wrapping high grade cigars, has heretofore been grown almost exclusively on the Island of Sumatra, and has been imported into the country at the rate of 5,000,000 pounds annually, notwithstanding an import duty of $1.85 per pound. Good Sumatra tobacco has been grown for some time at a profit on a commercial scale under shade in Florida, and through the agency of the Department of Agriculture and the Connecticut State Experiment Station, with the co-operation of local tobacco growers, the methods followed in Florida have been successfully applied to Connecticut tobacco. Nearly a thousand acres of Sumatra tobacco was grown in the Connecticut valley last year, and the results show that as good tobacco of this kind can be grown in this country as in Sumatra itself. There is every reason to believe that in time this country will be able to produce a large part, if not all, the high grade wrapper tobacco it consumes.

ORIGINATION OF NEW VARIETIES.

The above are a few examples of what the department is doing in the way of introducing new and improved varieties and methods of culture. It has not been content, however, to rest its labors here, but in coöperation with a number of the State experiment stations it has taken up in a very thorough way the scientific origination, by breeding and selection, of new varieties adapted to special purposes and conditions, along lines similar to those which are being followed by the Illinois Station with so much success in case of corn. Especially promising work of this character is being done with wheats, hardy oranges, disease-resistant cotton and cowpeas, and other plants.

Of the work on wheat, which is being done mainly in coöperation with the experiment stations in the principal grain-growing states of the northwest, especially the Minnesota states, a recent writer says: "Enough has been demonstrated * * * to show that the wheat crop of the world is now to be splendidly strengthened; that the theorists who have predicted ultimate starvation through impairment of the world's dietary are driven to other speculations; that it is quite possible, indeed that it is now an established fact, to produce wheats superior to the best the world has had. By the use of the new wheats the crop of the hard wheat region of the northwest may be increased by from three to five bushels per acre; which, reduced to a practical basis, assures an increase in the wealth of three states of from $25,000,000 to $40,000,000 annually." This may be a somewhat roseate view, but it is very evident that the yield and quality of wheat in Minnesota and neighboring states is undergoing a marked improvement as a result of the distribution of seed of such improved varieties.

VALUE OF THE WEATHER SERVICE.

The work of the weather bureau is widely known, and it is not considered necessary to dwell upon it here further than to say that there is ample testimony to the fact that the value of the property saved from loss by the forecast warnings of the bureau regarding storms, floods, and frost amounts to many times the cost of maintaining the bureau, and that the work of the bureau is becoming increasingly useful to the farmers of the country.

WORK FOR PROMOTION OF THE ANIMAL INDUSTRY.

It is to the very thorough system of inspection of animal products and study of animal diseases carried on by the bureau of animal industry of the department that is largely due the fact that we probably have the soundest and healthiest animals in the world and that our exports of animals and animal products amount to over $240,000,000 annually. As an illustration of the character and effectiveness of the work of this bureau on contagious diseases of animals it may be said that during the past year over 1,500,000 doses of blackleg vaccine were distributed and the reports show that its use reduced the loss of cattle to 0.51 per cent of those vaccinated, thus saving to stock raisers many thousands of head of cattle.

WORK ON PLANT DISEASES AND INSECT PESTS.

The work of the department on plant diseases and insect pests has given no less striking and valuable results than those on animal diseases. The department entomologists have given attention both to harmful and to beneficial insects. In fact, some of their most notable successes have been achieved by the introduction of beneficial insects, as for instance, the Australian ladybird, which saved the citrus fruit industry of California by destroying the pernicious scale insect. a success which bids fair to be duplicated by the introduction of another ladybird which preys upon the dreaded San José scale which is doing so much damage in all parts of the country. Another notable achievement of this character is the introduction by the department, working in coöperation with horticulturists in California, of the fig fly (Blastophaga), which has made possible the successful production of the Smyrna fig in this country. Smyrna fig trees were planted years ago in California, but they uniformly failed to produce mature fruits. Upon investigation it was found that in Asia Minor, where this fig is grown to perfection, its fruitfulness is due to pollination by means of the fig fly which passes through certain stages of its life in the wild fig of that region. The California orchardists therefore imported the wild fig tree and planted it in their orchards, and a number of attempts were made to introduce the fig fly, but without success. About four years ago the department took up the work of introducing the fig fly. By a systematic study of its habits it was found impossible to successfully introduce the fig fly into California orchards. It is flourishing there in abundance and California is now producing a considerable quantity of Smyrna figs which are considered equal in every respect to the imported figs. It is believed to be but a question of a few years when Smyrna figs will be produced in California in sufficient quantity to supply our own wants and to export.

OTHER LINES OF WORK.

The limits assigned to this paper permit only a passing reference to the work of the department in conserving and improving our forest resources, in improving irrigation methods and practices in both arid and humid regions, in improving the public road system of the United States, in developing the dairy industry, and in opening up foreign markets for American products, and forbid even a mention of many important lines of work. Suffice it to say that the underlying purpose which controls it all is to help toward the production in our own country of everything that soil, climate and other conditions will permit, and to extend in every possible way the foreign markets for our surplus products.

This is an imperfect survey of the organization and work of the department, but it may serve to show that the various scientific bureaus and divisions of the department, working in different fields are. with the co-operation of the agricultural colleges and experiment stations, obtaining results of great practical value affecting almost every phase of farm life. Granting this to be a fact, the question naturally arises, are the farmers getting the full benefit of the results obtained? I believe it is generally admitted that the dissemination of the information acquired has not kept pace with the demand for it, and that there is some ground for the criticism occasionally heard that farmers have not been informed as promptly as they should be of the results of investigations.

DISSEMINATION OF INFORMATION.

The department officials, like all others who have given thought to the subject, realize that with so many agencies engaged in the discovery of new truths of value to agriculture, and with a growing demand for information along this line from those actually engaged in farming, the problem of getting the results in useful form before farmers is assuming vast importance. The department has already kept in mind the fact that it was established to diffuse as well as to acquire agricultural information, and realizes that only a part of its mission is accomplished if the results of its work are not given promptly to those who need and desire them. The department, like the experiment stations, has in the past depended very largely upon printed reports and bulletins to accomplish the desired result.

Publications—Some idea of the proportions to which the publication work of the department has grown in the effort to make the results of its inquiries available by this means to those who have use for them is shown by the fact that during the past year the department issued 757 separate publications containing 31,302 pages. The total number of copies of all publications printed was 10,586,580, or one for each person actually engaged in agricultural pursuits in the United States. Of the total number of publications 259 were Farmers' Bulletins, of which 6,150,000 copies were printed. These Farmers' Bulletins give brief, clear summaries of the latest and best information acquired by the department, the agricultural experiment stations, and from other sources on a wide range of agricultural topics. They have been well received and have achieved a notable success if we may judge by the requests made for them. The Farmers' Bulletin series includes a subseries called Experiment Station Work, which is referred to here specifically because it promises to be especially useful in connection with farmers' institute work. These bulletins are compiled exclusively from the published reports of the agricultural experiment stations and similar institutions in the United States and other countries and their chief object is to disseminate information regarding experiments at the different stations, and thus to acquaint farmers in a general way with the progress of agricultural investigation on its practical side. The first volume of 20 numbers containing 590 pages and discussing 231 topics, has just been completed, and a table of contents, index, etc., have been prepared so that the bulletins may be bound in convenient form for reference. It may be of interest to those who care to preserve such publications that this series of bulletins is to be continued and, when other volumes are completed, indexes, etc., will be supplied for them. One of the most important popular publications of the department is the Yearbook, which has grown to be a large compendium (800 to 900 pages) of practical information on agricultural topics of all kinds. An edition of 500,000 copies of the last Yearbook was distributed.

The regular bulletins of the State agricultural experiment stations are sent to some 500,00 persons and a much larger number are doubtless reached by press or newspaper bulletins distributed by most of the stations and by the summaries of results of agricultural investigations and experiments now widely disseminated by the agricultural papers. But even with the most liberal distribution of printed matter a large proportion of the farmers of the country cannot be promptly reached if at all in this way.*

Farmers' institutes, a great need of our educational system is, therefore, wider dissemination of the results of agricultural study and research among those now actually engaged in farming. In the nature of the case the various agricultural colleges and experiment stations can directly reach only a comparatively limited number of the younger men whose influence will be felt largely in the improvement of the agriculture of the future. The greatest good cannot be accomplished, therefore, unless more is done to improve the agricultural practice of the present. The most effective means which has been found for the broad dissemination of reliable agricultural information in such a way as to make it available for the immediate use of the practical farmer in the farmers' institute.

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* The Department of Agriculture issues a monthly list of publications, which contains a complete list of all publications issued each month and explains how they may be obtained. This list is sent regularly to all who apply for it to the Secretary of Agriculture, Washington, D. C.

To an institution of such importance the Department of Agriculture desires and hopes to be most intimately and helpfully related. In this direction a beginning has been made, but much more needs to be done.

The chief service which the department has heretofore rendered has been through the distribution of its publications to institute workers, who have thus been enabled to keep in touch with the progress of agriculture as reflected in these publications.

Occasionally some officer of the department has spoken at the institutes, but there has been no regular plan for the oral dissemination of the information gathered by the department. The office experiment stations has in recent years issued a few publications giving account of the work of institutes in this country and similar work abroad, and has published the proceedings of the American Association of Farmers' Institute Workers. In a recent report Director True, of the office of experiment stations, says:

> In a few of our states the farmers' institutes are quite thoroughly organized, have liberal financial support, and reach a large percentage of farmers, but in many states and in the territories the movement is yet in a comparatively weak condition, and the organization and means for this work are inadequate. In 19 of the states and territories no special appropriations for institutes are made, the funds for this work being taken from funds provided for the support of the agricultural colleges or the state board of agriculture. In 23 states and territories the appropriations range from nothing to $1,000 per annum; in 12, from $1,000 to $5,000; in three, from $5,000 to $10,000; in four, from $10,000 to $15,000, and in three, above $15,000. While in most cases these figures do not represent the total expenitures for farmers' institutes, they indicate fairly well the extent to which the movement is organized in different sections. It is apparent that in more than half of the states and territories much needs to be done in the way of starting and perfecting an organization for conducting farmers' institutes. If an interest in the work could be aroused among the farmers in these sections and the way to secure the institutes pointed out, it is fair to presume that funds for the more liberal support of the movement would be speedily forthcoming. The Department of Agriculture, through the office of experiment stations, may assist in this work of organization in the same way that it has helped the experiment stations throughout the country. The visits of the officers of the department to stations in the different states and the conferences held at Washington and at the meetings of the Association of American Agricultural Colleges and Experiment stations have, it is believed, done much to systematize to work of the stations and make them more efficient. In a similar way an institute specialist from this office might visit the managers of the institutes and the institute managers and workers at Washington or in conferences held in different parts of the country. Already there is a successfully conducted American Association of Farmers' Institute Workers, which may easily be developed so as to become a very important factor in the further development of the farmers' institute movement.

At the recent convention of this association delegates were present from 24 states. How to secure competent institute workers was a problem seriously troubling nearly all of the delegates, even those coming from the states where the institutes are most thoroughly organized and successfully conducted. The demand is for institute workers having a wide range of knowledge regarding the science and practice of agriculture and particularly up to date information regarding the progress that is being made throughout the world in studying problems in agriculture, both at the experiment stations and on the farms. * * * In the task of developing and training these men the department can help by furnishing them with the department publications and information through correspondence. This is already done to a considerable extent, but may be more efficiently and thoroughly done by having in the department a regular agency for this work.

The department also hopes to aid in this movement by sending out lecturers to address representative institutes in different states on the work of the department. It is believed that much may be done to bring the work of the department directly to the attention of the leaders in this enterprise through the attendance of department officers at representative institutes held from time to time in the different states. In this way the influence of the department will be extended and its officers will have opportunities which they now lack, but very earnestly desire, for finding out what the farmers really wish to have the department do for their benefit.

¶ In general, it is the purpose of the department to act through its officers of experiment stations as a sort of clearing house for the farmers' institute movement, as it has done in the case of the agricultural experiment stations; that is, it will become a center for the collection and dissemination of information and influences which will serve to make farmers' institutes a more efficient means for the education of farmers and the improvement of agriculture.

At the request of the Secretary of Agriculture Congress has appropriated funds to enable the department through its office of experiment stations to undertake this work. The appropriation is to be used in employing an officer who will devote his time and energy to this work, visit institute workers and advise with them regarding the ways in which the department might help the institutes, study the problems of institute management at home and abroad, and seek to shape the department's work for the institutes so that it may be most helpful to this enterprise.

At the seventh annual meeting of the American Association of Farmers' Institute Workers, the plans of the office of experiment stations for aiding the farmers' institute movement were explained to the members, who unanimously adopted a resolution cordially approving the plans. The office is therefore encouraged to believe that it can do a useful work in promoting in the ways mentioned this means of disseminating the large amount of information relating to agriculture which is being gathered by the department and the experiment stations. It hopes soon to have in charge of this work an official capable of meeting in a measure the numerous demands which are coming into the department for lecturers to address representative institutes in different states on the work of the department.

During the past year over 2,700 farmers' institutes were held in 43 states and territories. The total attendance at these institutes was approximately 810,000 persons. It is evident, therefore, that while the institutes are rapidly extending their influence and winning the support of those engaged in agricultural pursuits, they are now reaching only a comparatively small proportion (about 8 per cent) of the farmers of the country.

Too much emphasis can not be laid on the importance of the support and co-operation of the farmers themselves in this work. The department and the associated agencies for agricultural education and research must fail of their highest usefulness unless they can enlist to the fullest extent the active interest of the farmers themselves. With the encouragement of such support their power for usefulness must rapidly increase, until science, wisely applied in the business of farming, will not only maintain our agricultural supremacy, but will raise farming to a higher position than it has ever yet occupied, and make it both a more attractive and more profitable occupation.

Chairman—Are there any questions anyone would like to ask Mr. Beal in regard to any particular part of this work?

Mr. Coldwater—How about the seed distribution?

Mr. Beal—The department has tried to make that distribution much more useful than it has been by insuring a better distribution of the seeds.

Mr. Coldwater—My experience is that some ten years ago I received a package of turnip seed and I tried it and the turnip seed proved to be white mustard and ever since that when I receive the distributions I put them right in the stove.

Mr. Funk—Where do you procure the mailing lists to send out the circulars, etc.

Mr. Beal—That mailing list is made up largely from applications, personal applications to the department; they are furnished by our Congressman who give the name of their constitutents and send them in, and in a number of ways the names accumulate and are revised from time to time.

Mr. Hostetter—Does the department consider Congressmen a good medium?

Mr. Beal—It has no choice in the matter.

Mr. ———Is it not a fact that the reports are sent to the Congressmen and they send them to the postmaster to deliver them to their friends?

Mr. Beal—That has been the practice but the names are now sent to the department and they are sent out from there and it works better all around.

Mr. ———The republicans get the reports and the democrats can't get them.

Mr. McKerrow:—I would like to make a suggestion. I would suggest to every member of the farmer's institute here the next time you have an institute in your coummunity inform your farmers that if they will write to the department at Washington and ask them for list of publications they will get it and then they can select such publications as are suitable for their use and send back the marked list or write for the numbers you want and you will get them. We do this in Wisconsin and we find democrats, republicans, prohibitionists and everybody getting the government publications.

Mr. Kellaher—I ask you whether you be democrats, republicans or prohibitionists, in this meeting that we come as brothers and not as politicians. Let us send this man back to Washington with better ideas than politics. We want Mr. Wilson, "Tama Jim" and his assistants to have better ideas of this glorious State of Illinois. Brother Coolidge, I want you to set your big foot down on all those fellows.

Mr. ———I don't know whether I understand you. I understand that you bound the bulletins and indexed them. These bulletins to me are of estimable value but they come at different times and get misplaced and I want them and I thought I understood you to say they were bound in volumes by the department.

Mr. Beal—Only to a very limited extent. We furnish the title pages and index so you can put them together. The fund is so limited we cannot bind many.

Mr. Black—One would be very useful in one part of the country and useless elsewhere and to bind them three-fourths would not be of use in other parts of the country.

Mr. Beal—I think Mr. Hostetter has adopted a very good plan by binding together related bulletins on related topics That is the plan I had reference to in our miscellaneous series with its short articles and a great variety of topics and it needs an index more than a bulletin with just one topic and one subject in it. I think that is the only way they can be preserved in useful form, by binding all of that series together, I refer especially to that sub-series.

Mr. Newman—How does Illinois stand in regard to attendance of the institutes?

Mr. Beal—I do not know.

Mr. Hostetter—We have in the neighborhood of 50,000 to 60,000 that annually attend.

Q. What is the increase this year over last?

Mr. Hostetter—I have not figured that out yet.

Q. Can anybody subscribe for the Crop Reporter?

Mr. Beal—Yes.

A. It publishes all the bulletins as soon as they come out. Take the paper and whenever the bulletins come out I write for it and get it.

Mr. Beal—The most direct way is to write and get the monthly list of publications. Anybody can write to the Secretary of Agriculture. It comes out monthly and you can see just exactly what the department has and what you want and write for it.

Q. Will the final crop value bear out the Department of Agriculture in its estimate?

Mr. Beal—I think the report of the past year will show the estimate to be remarkably accurate.

Q. Why don't the department say I told you so then?

Chairman—We will have to pass the subject now and listen to a reading by Miss Alma Widemeyer.

Chairman—We will now have the pleasure of listening to Uncle Henry Wallace of the Wallace Farmer, discussing the subject of the "Relation of Landlord and Tenant," one of the most important of the day. There is not the slightest doubt in the world that he knows all about it for he admits it himself:

THE RELATION OF LANDLORD AND TENANT.

(A paper read at the Round-Up of the Illinois Institutes at Bloomington, Ill., Feb. 24, 1908, by Henry Wallace, Editor Wallace's Farmer.)

GENTLEMEN OF THE INSTITUTE—The interest in the subject which you hav asked me to discuss is increasing from year to year for the simple reaso that the number of landlords, or the land owners who do not till their ow

Sample of what the land owner furnishes with a dairy farm in Northern Illinois, where the fertility of the farm is maintained and the tenant and land owner both prosper.

farms, and the number of tenants who till them, is increasing with each decade. The bulletins sent out by the census bureau, containing a summary of the census returns, furnish some interesting information on this point. From it we learn that the per cent of farms in Illinois operated by owners, including in this term part owners, owners and tenants, and managers, was 68.6 per cent in 1880, 66 per cent in 1890 and 60.7 per cent in 1900.

The total increase in the number of farms in the State in the last ten years was 9.8 per cent, this increase being mostly in the sub-division of farms for trucking purposes near the large cities, there being in round numbers 20,000 of such farms under 20 acres in the State of Illinois.

The number operated by owners has increased during the same period one per cent, the number of farms rented for cash 30.8 per cent and the share tenant farms 24.5 per cent.

The same laws that have operated in Illinois are operating in Iowa and all adjoining states, and that we may see the extent of the influences that are operating, it is well to examine the census bulletins for these states.

In Iowa, in 1880, 76.2 per cent of the farms were operated by owners, including as above part owners, owners and tenants, and managers; in 1890, 71.9 per cent, and in 1900, 65.1 per cent. The number of farms operated by owners has increased 2.5 per cent since 1880, the total number of farms 23.3 per cent, and the total number of tenant operated farms 80.5 per cent. In that state the number of share tenants has decreased from 19.3 per cent in 1889 to 15.4 per cent in 1900, while the number of cash tenants has increased from 4.5 per cent in 1880 to 19.5 per cent in 1900.

In Indiana, in 1880, 76.3 of the farms were operated by owners; in 1890, 74.6 per cent; in 1900, 71.4 per cent. The total number of farms in that state has increased in 20 years 14.3 per cent; the number operated by owners, 7.1 per cent; by cash tenants 51 per cent; by share tenants 34.7 per cent. The number of farms operated by owners, with the inclusion mentioned above, in the state of Missouri, in 1880, was 72.7 per cent; in 1890, 73.3 per cent; in 1900, 65.5 per cent. The number of farms operated by owners increased the last ten years 13.6 per cent; cash tenant farms, 32.8 per cent; share tenant farms, 38.4 per cent.

In the newer state of Kansas, the number of farms operated by owners in 1880 was 83.7 per cent; in 1890, 71.8 per cent; in 1900, 64.8 per cent. There was a decrease in the number of farms oporated by owners of 6.2 per cent, an increase in cash tenants of 75.6 per cent, and in share tenants of 16.9 per cent, the cash tenant system predominating in the eastern division where land is more valuable and the settlements longest established.

Take the still newer state of Nebaska. The number of farms operated by owners in 1880 was 82 per cent; in 1890, 75.3 per cent; in 1900, 63.1 per cent. In the last ten years the number of farms increased 7 per cent, the number operated by owners decreased 10.3 per cent, while those operated by tenants of either class increased in about the same proportion.

It will thus be seen that whatever may be the influence at work in increasing the ownership of land by those who do not cultivate it, they are operating over a very large portion of the Mississippi valley, and the more productive the land the greater the tendency to what for want of a better term we call landlordism, or to the increase of landlords or land owners on the one hand and tenants on the other.

It may be well preliminarily to discuss the relation that should exist between landlord and tenant to inquire as to what are the causes of this movement. One very efficient cause is the desire of farmers after they have passed 60 years of age to move to town. Your towns and cities are rapidly filling up, if not already filled with retired farmers. So are the towns and cities of Iowa. So are the towns and cities throughout the entire corn county, by which I mean the sections that produce the largest crops of corn. Nor is this an unnatural movement. The great and increasing difficulty of procuring help when the farmer is no longer able to go into the field himself, the equally great difficulty of finding help in the house when housekeeping becomes a burden on account of old age, the desire to secure better educational facilities for the younger children, and possibly, the desire of the farmer to live closer to the church so that he can attend prayermeeting, are the efficient and ever acting causes. He finds it easier to turn over the management of the farm to a son or son-in-law and thus keep the children within reach of their grandmother than have them go west and grow up with the country. He becomes a landlord and the son, son-in-law or nephew becomes a tenant.

This type of landlordism might well be called the paternal and in itself can do no harm to the country inasmuch as the farm is still under the owner's eye and the better methods of the husbandry that have enabled him to secure a farm that will rent for enough to maintain him in his old age will most likely be continued by the tenant. We doubt, however, whether the farmers who have moved to town are as well satisfied as they thought they would be, but we have seldom known a farmer to move to town and then go back on to the farm unless he was compelled to do so.

A more dangerous influence leading to the increase of landlords and tenants is the low prices of money which have prevailed for the last four or five years. Until within the last 12 months it has been difficult to obtain an investment that will yield more than 5 per cent interest or to keep any large amount of money invested at more than 4 or 4½ per cent. The rate on government bonds, first-class railway securities and gilt-edge mortgages has been so low that capitalist have been looking about for a better paying form of investment. During the same period of years, farming has been as a rule a very profitable business and it is not at all strange that bankers, manufacturers and monied men of all sorts have been investing in land that is capable of returning at least as much interest as any other gilt edged security and at the same time is likely to increase in value as rapidly as the increase in population, which is about 2 per cent per annum. It requires no elaborate calculations to show that 5 per cent rent plus 2 per cent increase in value is a better investment than almost any other of equal permanency and safety. This is especially true of corn lands of the Mississippi valley.

In the last five or ten years markets for corn have largely increased. The manufacturers of starch, glucose, alcohol and its combinations, have increased not merely because of the widening markets for the main products, but because of the great number of and increasing market value of the by-products, of which there are 25 or 30, which the world is using in ever-increasing quantities and the names of which I need scarcely mention to an audience such as I have before me. Besides, the increase in export has been going on with leaps and bounds wherever the price of corn has been kept down to what seems now to be the normal but would have seemed an extravagantly high price ten years ago, and this is likely to go on increasing, not for human food but as food for stock and for manufacturing purposes.

Inasmuch as the area of what we might call the corn land, that is land that will produce corn to the greatest perfection, is limited on the west by altitude, on the north by excessive cold, on the south by excessive heat, and on the east by pre-occupation of the land; it is quite clear that these lands must increase in value faster than population, and the more so because the United States, and particularly these states I have mentioned, have the practical monopoly of producing surplus corn in the entire world. This explains, to me at least, why the ownership of lands is passing out of the hands of the men who cultivate them and seems to me proof positive that this state of things will continue indefinitely and perhaps forever.

The tendencies are at least in this direction now and while they may be checked in certain localities, the great probability is that they will continue operative in the future as well as in the past. For example, the census reports for 1910 may show an actual increase in the numbers of the men who cultivate their own farms because in the census reports two acres and less are called farms. Interurban lines will result in cutting up of thousands of farms into from two to one acre lots and thus greatly increase the number of farms in a given district, making apparently a relative but not a real decrease in the number of tenants.

Again, the extension of interurban lines and the improvement of the school facilities in country districts may lead many townsmen of agricultural tastes to buy farms, live on them, and have them conducted by managers or by farmers on the share of the profits, and to this extent will increase the number of owners as classified by the census. There is, as noted in the census reports, a disposition on the part of owners of lands to work them with hired labor under their own supervision or under that of a manager, and I have no doubt that this will tend to somewhat decrease the number of tenants in the future.

It might be well to state that the census reports as now given are misleading to this extent, that every patch of two acres and less is counted a farm, and in Illinois, on account of its having Chicago at one end and St. Louis at the other, there are now 20,000, or 8 per cent of the entire farms of the State that have less than 20 acres.

From this point of view, it is very important to determine at this stage the relation that should exist between landlord and tenant. I do not mean by this merely the personal relations but the best methods of leasing or renting lands, the kind of cultivation and management essential both to the welfare of the tenant and that of the land owner, and not merely that but the methods of cultivation and of leasing that will prevent these great corn lands that must produce food for the hungry nations from losing their fertility and on the other hand increase it, and in doing so increase the social, financial and political power and prestige of these corn states in the nation at large and by so doing increase the power of the nation to exert a helpful influence among the nations of the world.

And first, the relation existing between landlord and tenant should be as nearly as is possible, humanly speaking, consistent with absolute justice, equity and fairness between man and man. They are co-workers, partners in the work of producing foods for the hungry nations, and each should receive a return equally proportionate to his investment whether of land or labor.

Whether the rent be in cash or kind, that is, a share of the crops, the landlord must not expect to get as high a rent for land of little productive value either because of the quality of the soil, location or improvements, as he should for land of higher value. If the land is rated high on the market, there is ordinarily good reason for it and the tenant can, under these circumstances, afford to pay a higher cash rent or a larger share of the crop.

Equity demands a fair rent and expediency is not less urgent in its demands. If a landlord demands more than is just, he may secure it for the time and thereby impoverish his tenant, but that tenant, smarting under the conscious wrong, will take it out of the land, thus in the end out of the landlord. Where unjust rents prevail for any great length of time, the furrows begin to complain, the farms begin to look sad, the fences lean or vanish, the countenance of the tenant changes, schools dwindle, churches decline and the passing traveler realizes that some calamity has visited that country. Sad-eyed women and over-worked children are mutely eloquent of the wrong and injustice perpetrated by the landlords, whether intentionally or ignorantly. History is full of illustrations of the effects of unjust rents and in every case time brings with it its inexorable revenge.

The landlord system of Ireland lasted for nearly 300 years. To begin with, it was bad and based on rank injustice. The temptation to extort rack rents was too great for average human nature and rents rose higher and higher to be squandered away from the land in riotous living. Famine spread its death pall over that fair land and having been able to lay by no reserve by reason of the landlords' extortions, the tenants died like flies in a frost. Migration followed, reducing the population one-half. Then came the gradual impoverishment of the landlord until the English government is now forced for the sake of the peace and prosperity of the country to compel the landlords to sell at the tenant's price and terms of payment.

The French revolution was made possible by the oppression of the common people, the farmers by the nobles or landlords. To come nearer home, the extravagant rents extorted by the Southern landlord keeps the South agriculturally poor, landlord and tenant alike living from year to year from hand to mouth. These old-fashioned laws of righteousness, from whatever source we may think they come, whether they be Divine or the record of human experience for ages, have a queer way of executing vengeance in a most unexpected manner on those who violate them, whether purposely or in ignorance.

Unfortunately, the temptation to extort rack rents, by which we mean rents which are in excess of justice, is usually irresistible to the average man. There are three controlling factors: First, there is no more land being made and nearly all the agricultural land of any value outside of the irrigation districts is now in the hands of farmers or speculators; second, the number of possible tenants is increasing rapidly and there is, therefore, an increasing demand with a decreasing supply of farms; third, the costs of moving from one farm to another constantly tempts the tenant to pay an unjust rent and work a little harder and live a little closer rather than stand this inevitable loss. Hence, we may confidently expect rent to advance faster than land values, the tenant thus contributing an undue share in the partnership between him and the landlord.

This is the history of rents in all the older countries and it will, without much doubt, be repeated in the Mississippi Valley and will be followed by the same results that have followed it elsewhere—the impoverishment first of the tenant and then of the landlord.

Second—The relation between the landlord and tenant must be such as will enable the latter to adopt permanently a system of farming that will maintain and increase the available fertility of the soil. The agricultural wealth of the Mississippi Valley does not lie in its fertility as reported by the chemist, but in its available fertility—the fertility that can be coined from year to year into actual dollars. As I have often told many of you Illinois farmers, your land is theoretically inexhaustible; so are the naturally good lands of Ohio, Pennsylvania, and New England. These lands last mentioned have been falling in value continuously for thirty years, not because their fertility is exhausted—the chemist will tell you it is not—but because the system of farming which their owners have in a manner been compelled to adopt has wasted the available fertility. Outside of the dairy districts, they can not keep cattle at a profit and hence have been growing grain, hay, and straw for sale off the farm, and in these years have thus reduced the humus content of the land so that the fertility naturally and always there is no longer available; therefore, the lands have fallen in price. This is not the only reason but it is the main reason.

Can you Illinois landlords, who are compelling your tenants to pursue the same line of policy, expect to dodge the natural consequences? You may point with conscious pride to your rich, well drained soil in which the great Creator has been storing up humus for countless ages, and say: We are exempt from the action of otherwise inexorable law. You may die and probably will die in that delusion, but your children will be wiser than you are. In short, if you continue your system of exclusive grain farming which so many of you have adopted and force your tenants to adopt, both landlord and tenant will come, as landlords and tenants in other states and countries have come, not to property but to poverty. The tenant will be the first to suffer; he has always been first in suffering, for in the proportion that the soil loses its available fertility your rents will become rack rents.

A good tenant dislikes moving with its inevitable loss and concludes to pay the advanced rent, to work a little harder, live more closely, and hope for better times and seasons. He aims to cover more acres, perhaps, and avails himself of tramp labor. When bad seasons or low prices come, as come at times they will, he becomes desperate. The farm takes on more and more the look, as an old Scotchman one described it to me, of a "widdy's" farm and shrinks in value both real and commercial. The time may come in some of the corn counties of this State, where renting is the rule and ownership the exception, when tenants will form a union and agree on the rents they will pay, refusing to move and boycotting any man who pays in excess. Has it ever occured to the landlords how absolutely helpless they will be should such a calamity as this ever occur? It is to be hoped that it will never come, and yet it may.

I see no way of avoiding the results which I have described except by the introduction of some form of live stock farming. For it is only by live stock in connection with grain growing that the available fertility can be maintained and increased.

Unfortunately, the difficulties in the way of adopting live stock farming in the portions of this State where it is most needed are very great. To begin with, on the corn lands that have been rented a long time, there are few farm buildings beyond those required by the family and the work horses, and many of these are poor. A change to live stock farming involves at the very first an expense to the landlord that breaks his heart. There are few pastures, and on trial it may be found that lands which once grew clover will respectfully decline to grow it when wanted.

Again, many of these tenants, while expert corn growers, know nothing about breeding, caring for, or feeding live stock. They will be required to learn a new business—become, as it were, new men. The boys might learn, but disgusted with the hard and unprofitable task of making high rents and a good living on a worn out or wearing out farm, they are likely to determine to wash their hands of the whole business and go into railroading or anything else that will give them shorter hours, better pay, and a good time.

Third—The relations between landlond and tenant should be such as will tend to the develpment of the high character in both. The prosperity and happiness of the country does not depend so much on the fertility of the soil or the advantages of the climate as upon the character of its people. There is no richer land under the shining sun than the valley of the Nile, yet for ages it has been the home of the Fellahain, little better than slaves. There is no better soil than some parts of India and yet famine often stalks abroad even in the fairest portions of that land. There is no land in Illinois superior to about four or five of the best counties in Ireland where an acre of grass will keep a cow ten months in the year and fatten her without grain, yet these same counties have for 200 years been the homes of discontent, and solely because of the unjust method of renting land. Unless even the best lands are cultivated by men of the highest practical farm intelligence, they will in time feel the biting effects of ignorance and refuse to respond to the labor of the husbandman.

I put the question to you in all candor: Does the method of renting land in many sections of Illinois tend to develop the highest intelligence either in the landlord or the tenant or in the family of either?

The landlord when he moves to town frequently quits thinking about farming, drops his agricultural paper, takes a cheap daily, and every morning proceeds to fill up with the east wind of partisan politics, the details of accidents, murders and divorce suits, and a thousand other things concerning which ignorance is bliss. He is often interested solely in collecting rents. I am speaking now of land rented solely for grain for sale on the market whether the rent be in kind of in cash.

Meanwhile, the tenant ceases to think of the higher departments of farming, such as dairying, stock raising, or feeding and balanced rations. He does not even consider the maintenance of soil fertility. What is that to him? He may be here only a year. Let the next fellow look out for that. If he does grow clover for fertility and thus increase the yield, he simply tempts the landlord, if he be a covetous man, to raise the rent or at least have rent raised on him by a competitor who wishes to harvest his stored up fertility.

The tenant confines his attention and study solely to the problem of how to secure the best possible results for the time being and thinks, if he does not say it, "after me, the deluge." Except in the most favorable years and with the best landlords on the best land, he does not seem to get on in the world. He hears himself referred to as "only a tenant" and this phrase, "only a tenant," keeps ringing in his ears and he says to himself: "Why should I subscribe for an agricultural paper or buy a farm library? I am only a tenant." That farm of his own, the dearest home of the true farmer, recedes into the dim distance until at last he counts himself a fool for ever indulging in such a dream.

Have I drawn the picture too dark? Go out among the tenants in some of your great corn growing counties and on your richest land, naturally; visit among these people and get into their confidence; get them to tell you their hopes and fears, and you will see that I have painted the picture in colors altogether too bright for the existing facts.

Your tenants on your grain farms may be hopeful in such years as this with both big crops and big prices, but there is an undertone of sadness even now for they know that years of light crops and poor prices will come as they have ever come in the past and the "tale of bricks"—the rent—will not as a rule be diminished.

If Illinois is to be the State great in wealth, great in intelligence, and great in agricultural power that the Creator evidently intended it to be, there must be a different system of renting land introduced, and that before many years; a system that will at once conserve the fertility of the soil and will develop a higher degree of intelligence both among landlords and tenants. And by intelligence we do not mean general intelligence, nor political intelligence, but farm intelligence, that high intelligence, that breadth of view, that solidity and stability of character which farming on the lines has developed in every nation of good farmers on the face of the earth.

There is drudgery in every kind of manual labor which does not occupy the mind as well as the muscle. There is no education in the mere work of plowing without knowing why we plow, or in growing "just corn" without knowing what kind of corn we are growing and how it can be improved.

The relations between landlord and tenant should be such as to encourage the tenant to put brains into his work even if he be merely growing corn. You do not want him to resemble the farmer which the writer of the Apocryphal book of Ecclesiasticus had in mind when he exclaimed:

"How can he learn wisdom who followeth the plow, whose talk is of oxen, and who glorieth in the goad!"

Far nobler is that conception of the farmer expressed in the 28th chapter of the prophecy of Isaiah, the 24th to the 29th verse:

"Doth the plowman plow all day to sow?
Doth he open and break the clods of his ground?
* * * * * * *
For his God doth instruct him to discretion—and doth teach him,
* * * * * * *
This also cometh forth from the Lord of hosts,
Which is wonderful in counsel, and excellent in working."

It is only when we provide a motive for the tenant to put brains into his work, to know why he does this and that, and how it can be done with the least labor and with the best results, that we develop so far as lies in our power the noblest traits of character and make the practical management of a farm, as the preachers say, "a means of grace."

The higher the branches of farming, the more culture, using that much abused word in the country and not the city sense. All honor to the man who can, by his superior skill, grow 100 bushels of corn per acre, but greater, far greater, honor to the man who can grow this corn and use it to the best advantage in producing pork or beef or butter.

If we are to develop the highest type of character on the farm, we must soon and as rapidly as possible so shape our rentals as to induce tenants to undertake these higher branches and thus not only maintain the fertility of the soil but develop the highest possible type of character on these great prairies which are capable of producing a type of character than which there is no superior in this broad land. Go on as some of you have done and many of you are doing now in your great corn raising counties and in time you will develop a type of character of which you will not be proud. You will prepare the way for the walking delegate who will determine your rents, and prepare also in time of trouble for the home-born demagogue who will expound the doctrines not of the best in socialism but of the worst. Your farms will increase in size and not decrease. Your schools will decrease in numbers and in attendance. You will have a cheaper grade of preachers. The sons and daughters of your tenants will not stay on the farms but will flee to the cities, while your own sons will look upon farming as disreputable and the farm only as a source of income—a bond from which to clip coupons.

On the other hand, encourage a system of farming that will call out all that is best in men and best in the land and in time of race of tenants will be developed who, like the tenant farmers of England, will not care to own the land because they have not the capital both to own the land and stock it and prefer a long lease at a just rate and use their capital to the best purpose in the handling of live stock. When this time comes land will have a permanent and increasing value to the landlord who has the skill and wisdom to bring this to pass.

Chairman: Mr. Frake will give us a paper upon another phase of the subject and when that is over we want a discussion on both sides of the subject, Mr. Frake:

Mr. President, Ladies and Gentlemen—The program committee has asked me, knowing very well that the distinguished speaker who has just preceded me would say nearly all if not quite all that could be said on the equitable relations of the landlord and tenant, so I give a few of the legal relations of the landlord and tenant.

All leasing of farm lands should be in writing, by so doing many misunderstandings would be avoided. Even then many legal rights and liabilities may have to be adjudicated by our courts.

Permit me to give a single example: A lease is made. Nothing is said in the lease about the tenants committing waste and the tenant commits waste, he is liable on the demise for the waste committed unless exempted by the terms of his lease.

At common law a landlord had no lien for the rent that was due until he had proceeded with a distress warrant to levy upon the property of the tenant, which levy could only be made upon the property not exempted by the statute. In 1873 the Legislature of the State of Illinois gave every landlord a lien upon the crops grown or growing upon the demised premises for the rent thereof whether the same was payable wholly, or in part, in money or specific articles of property or products of the premises, and also for the faithful performance of the terms of the lease, such lien to continue for a period of six months after the expiration of the term for which the premises were demised. Under this act our courts held the lien on the crop was only for the rent of the year in which the crop was raised. The lien was paramount, must be noticed by all, and could be lost only by waiver or failure to enforce it at the proper time. It was not dependent on the levy of a distress warrant, but the landlord was not entitled to proceed against the crop until the rent was due; that the lien upon the crops grown on the demised premises does not follow such crops into the hands of a *bona fide* purchaser without notice, but a sale of the crop with notice of the lien does not defeat the lien. The landlord under the act of 1873 not having any lien upon the crops until the rent was due, frequently was defrauded of his rent by reason of the tenant selling and removing the crops from the demised premises. To remedy this the Legislature passed in 1877 an act providing that if any tenant shall without the consent of his landlord, sell and remove or permit to be removed, or be about to sell and remove, or permit to be removed from the demised premises such part or portion of the crops raised thereon as shall endanger the lien of the landlord upon such crops for the rent agreed to be paid, it shall and may be lawful for the landlord to institute proceedings by distress before the rent is due. Under this last act there has been but few adjudications in our upper courts. They have decided that feeding crops to stock places the crops beyond the reach of the landlord's lien. It is a removal of the crops within the spirit and meaning of the statute and consequently the landlord may distrain before the rent is due if he feels that his lien is impaired.

Bear in mind that the landlord at common law has no lien upon the chattels of his tenant such as given by the statute upon the crops; he has only a right to distrain when the rent is due.

CROPPERS. (Crops.)

Where the property of the crop does not at any time vest in the tenant neither in whole nor in part but remains in the owner of the soil who controls it at all times, and divides to the occupier his share, neither the relations of tenants in common, nor of landlord and tenant is created. Am. Eng. Enc. Vol. 4, 899.

A cropper has no assignable interest to his share of the crop before division, consequently a cropper has no such interest in the crop as can be subjected to the payment of his debts while it remains *en masse*. Until a division, the whole is the property of the landlord. (So held by North Carolina, Vermont, New York and Rhode Island.)

Where in a lease of a farm it was stipulated that all the hay and fodder raised should be fed out on the farm to stock and the stock kept on the farm until the expiration of the lease, and then divided; it was held that the property in the hay never passed to the tenant nor the stock before a division, at the end of the term, and that consequently neither hay nor stock could be attached by his creditors. In regard to these he was a mere servant of the land owner. (So held in Massachusetts, Maine and New Hampshire.)

A contract for working a farm on shares does not amount to a lease. It vests no title to the property in the laborer nor gives him more than the right to enter for the purpose of cultivation. After the crop is severed and the owner's share is deposited in a portion of the land he has no further right to enter that portion, and any subsequent entry will be trespass.

In every leasing of farm lands, even if not expressed in the terms of the lease, there is an implied covenant that the farm shall be farmed in a husbandlike manner, in accordance with the best methods in the neighborhood in which the premises are located.

As between landlord and tenant, between debtor and creditor, and under our statute as between executor and heir, growing crops are personal property, but between a trespasser and the owner of the soil, and a vendor and vendee, they are real estate.

Powell vs. Rich, 41 Ill., 469.

MANURE.

Manure may or may not be a fixture. Am afraid that it is too often regarded by some of our indolent farmers as a fixture around the barnyard, but when it is made in the ordinary course of husbandry on farming lands from the consumption of the crops raised on the farm it is considered part of the real estate (a fixture) and cannot be attached or sold on an execution separately from the land. An agricultural tenant on vacating the demised premises is not entitled to remove the manure made thereon during his occupancy without an expressed stipulation to that effect. It has been thus decided by many states, among them Iowa, Pennsylvania, New York, New Hampshire, Indiana, Maryland and North Carolina.

I have been unable to find any decisions on this point rendered in this State.

I am inclined to believe that an out-going tenant would have a right to sell and dispose of what straw is left at the end of his tenancy unless he is prohibited from so doing by the terms of his lease. This need not be in writing, however, provided the term for which he rents expires within a year from the date of the leasing.

I kept Mr. Wallace up here on purpose to answer questions.

Mr. Cole—From what experience I have had with tenants and being a tenant I am satisfied there is only one point and that is that humane feeling which makes us all consider every man his brother. That the duty of the strong is the duty of looking after the weak. We would look with contempt upon the man who was six feet six who would take the man who was five feet tall and box his ears and kick him around. But we say it is business if a man who is intellectually and financially stronger takes his weak brother by the seat of the pants and the coat collar and throws him into the river, robs him of every dollar he makes by force of strength, and we have plenty of that kind of men. I believe that if we, as landlords, will give our tenants to understand that first we expect of them absolute justice and right and that we are ready to treat them on the same plane, that just so long as they will take our farms and farm them as good farmers, consider them as their own that just so long they have a home there. I have one tenant who has been with me 22 years and for 18 years of that time he has never had a written lease. I made one for three years when he went on the farm. He never asked me year after year whether he was going to stay, he fall plows and draws out the manure and year after year that farm is increasing in value and pays me now over $1,000 to $1,200 a quarter. I have another man who has been with me for 18 years and when he found his family had increased in size that he needed more land he left me with tears in his eyes and says: "You are my own father for he could never have used me better." At one time he owed me $1,800 for cash rent and I never asked him a dollar for rent and when he wanted to sell his crop I said no sir, don't you sell a bushel. He said my interest is piling up, and I said I will take the chances. I don't want your babies and I will have to depend on the crop and when he left my farm he had paid every dollar he owed me, took 40 head of cattle away with him besides his horses and other tools. And if you will make your success you will see large crops in your barns. Furnish them barns to put their crops in to protect them and to protect their cattle from the inclemency of the weather.

In other words their success is our success and our meanness, while it robs them of their just reward of labor, will certainly deprive us of what we might otherwise get.

Mr. Hobson—I have been at many institutes before but I never heard before a single word of the law read. I have never studied that phase of the question. There is but one law that will apply to the case and that has already been alluded to by Mr. Cole and that is the great general law "Do unto others as you would have others do unto you." I think this the most important question perhaps that can come up before this body of farmers. You have heard the views of these men, you have heard them allude to the past and allude to the future. The question has been discussed in all of its phases, yet it is a question that effects not only the landlord, but the tenant as well, and I believe our system of farm tenants in Illinois is more satisfactory than a great many people think. I find the farm tenants are not only making money. I am a tenant myself and am paying $8 to my landlord and I think he is one of the best men I ever met and I believe that when we as tenants comply with that law I have already cited there will be unions on the farm but it will not be the union of tenants but of tenant and landlord. My landlord and I understand each other. He wants the land kept fertile and he has the right and he ought to demand it of me, it is as much my business as his to see that the fertility is maintained because from it must come my bread and butter, so you see we are coöperating and what is my interest is his interest, and when all act upon it there will be no necessity of any trouble between the landlord and the tenant, and when this comes to pass throughout the State, Illinois will continue to blossom as the rose and grow richer and richer, and the landlord will reap his reward and we tenants will get our reward and support.

Mr. Black—I have been both a tenant and a landlord. Now I want you all to remember here that there are "white crows" among tenants and landlords.

Mr. Foster—I want to say that I believe the greatest cross today between landlord and tenant is the cash rent system. We know more about it in Logan perhaps than in any county in the State because of the fact that a large portion of our land is owned by individuals who do not live in the State and whose land is rented for cash year after year. The tenant farmers know they are here for a time and get all they can get out of the land. The tenant has obligated himself to pay the landlord a certain amount of money and he does not care what becomes of the land in years to come so that he makes the rent, and I believe this one of the greatest difficulties between the landlord and the tenant in this country. Let them divide the rent, let them divide the profits of the land, then they will both be interested, but the man who is paying the cash rent is not interested in the soil. It is how much he can get out of it. I hope the time will come when not a farm in the State of Illinois can be rented for cash rent.

Mr. Brown—I am a freak in this audience; I am a landlord and a tenant. I farmed 80 acres and as my boys grew up the landlord bought more land next to me. Now he says, "Charlie, don't you buy land next to me if you want to buy land," so I went into McLean county. I have made every dollar by cash rent and I do just as much as I would for a share. I raise my corn and feed it. I have more corn than I can feed and I bought one load to fill up, and I haven't sold them yet and I don't intend to until May or June.

Mr. Oakes—As for this cash system, in our locality in Peoria county, it takes very well. I have one piece of land the tenant has had for nine years and has rented again for three years, 84 acres and $475 cash rent in advance. He has made money on that place. It is well improved, good land and improvements and he has done well. My sisters' farm adjoins it which he rents, and he claims he has made $1,000 in three years and he has already rented it for another three years and he won't rent for grain rent. I also rent another piece of land and a tenant came to me and wanted to rent the land for cash. He knew just what he was doing. He knew after paying cash rent probably he would have a great deal more than if he gave me grain rent. It usually rents for one-half so he preferred paying cash. That is the favorite way of paying rent in our neighborhood and we can rent at $5.25 an acre and they make money off of it and they will rent it for five years to come and are glad of the chance.

Q.—Does the English farmer pay cash rent or share?

A.—Cash.

Mr. Cole—Excuse me for speaking again. I have had considerable experience and I will say that it all depends upon the character of the tenant and whether the landlord gives him his experience, his knowledge of farming and the management of the farm, his brain to the tenant. Where the tenant possesses ability to farm the farm he handles he can make more money on cash rent than on the share rent in ten years. I rent all my land on the cash principal. If that is true under good management it would be true of the tenant if he had the ability to run it. So as far as cash rent is concerned it is not a hardship upon the tenant and he should not abuse the farm because if he is getting a share he should be no more interested in preserving the fertility of the soil than with the cash rent, nor vice versa if he has the farm for a series of years, but a good tenant can make more on cash rent.

Mr. Kellaher—I have listened this afternoon to this terrible condition that Brother Wallace has been telling us about. It should be land owner and tenant. We only know one Lord and He don't rent any land. I have tenants right around me and one of them came to me the other day, they were hauling corn, and said, "Have you read the paper published in Des Moines, Iowa"—what do they call that—and he said, "didn't you see that item about clover, about the fertility of the soil?" I was taking the paper myself; and he said, "what does he know, he isn't a practical farmer." I remember the time he was preaching out our way and yet there is "more in his head than a fine comb will take out. I am sorry to hear the paper he has read here today. We do not anticipate any such result as he has read to you. I have been 46 years on my farm." I never got enough to leave it yet. I have had tenants and they lived better and put on more style than I did. They had better rigs than I did even if I didn't get to church very often. The tenants today, lots of them are living better than the land owners. What he calls "retired" farmers, we call "tired" farmers. Those men who are renting this land keep their farms better than I do. They are happy and contented and put intelligent thought into into their business. Let us not send out such dangerous sentiments throughout the broad land as Mr. Wallace has brought here from Iowa today. I tell you gentlemen and I don't want you to laugh or cheer, they are dangerous, because if I said so, it would not make any difference, but I know there are many like me who don't go to church but who read Wallace. People ask me why I was not at church, what were you doing! "I was reading Wallace," he is an expounder of the truth.

Mr. Wallace—You are all right, Uncle Dan.

When you come into our state, I want to admonish you to stop that socialistic and anarchistic talk. I tell you he is getting pretty high up and you have got to call him down. Do you remember the time I called you down. Tell what you called me then. I will not tell it. I hope you will go home benefitted by this meeting. As Brother Cole has told you it is a land owner rather than a landlord. We are not anticipating and trouble. Those men who have retired and gone to live in the village are men not capable to work. One of my best neighbors for 46 years has a sale today, retiring. He is not gone to town to be a loafer or a saloon bum but to be a grand American citizen, the grandest title on earth, greater and grander than your landlord in Ireland.

I remember when Mr. Abraham Lincoln made his speech at Chicago and the immortal Lincoln denounced slavery and now Horace Greeley No. 2 from Des Moines comes here and tells how black this picture is and all the socialists will read his speech in Chicago tomorrow, we won't have it. We won't have it. We will stop him. Yet we like to have him come and I would not be here today but I came to hear him.

Q.—In regard to clover why does not our soil produce the clover it did 20 years ago?

Mr. Wallace—That would be a question I could not answer just now.

Mr. Hostetter—If you will permit me I will tell the gentleman he will get the information later on in this meeting. We have had some soil investigation going on by our experiment station and we have discovered something no one ever thought of before. It will be discussed later on the program.

Q.—I would like to ask Mr. Cole what he means by stating that cash rent is the best for the landlord?

Mr. Cole—I base it on actual experience. I rent for cash. I never did believe in robbing. I never charge over $4.20 for rent for land I could sell at $100.00, but figuring at $5.00 an acre I take that as a basis, $5.00 an acre, and I say $800 00 for the quarter section, and I know in ten years I get on an average of $200.00 more on each quarter section than I do when I rent for cash, and another thing yet the tenant can hold his crop when prices are low. He can put into the crib and hold it. The man that is onto his job doesn't sell any product of the farm at a less cost that price of production if he can avoid it. When prices are low, if we will wait five years we will get a good price and experience has taught that, and the renter is in better shape to hold his crop if he has to pay cash and he will get better results.

Mr. Mitchell—It has been stated here that the cash rent will tend to make the tenant less careful than the share and that is a mistake for the reason that if they take an interest in their work and are good tenants they will not care to rob the soil in either case. Now down in Egypt we don't raise such crops on our hill farms as you do around here. We sometimes have hot winds that parch our crops, and the cash system would not be fair.

Mr. McKerrow—I began business as a farmer on a rented farm up in Wisconsin that was pretty well run out with grain growing and cash rental, and I began by sowing the farm to clover, grasses and grain and feeding stock on it, and for seven years I made a living for myself and family and earned the money to start me on a farm of my own. When the seven years were up they offered me the farm again and I think I was a good tenant. I have had a little experience in renting farms since that time, not so much renting farms of my own but farms I have had charge of and I find if the landlord is fair he can usually get a good fair tenant by looking around a little. Now it matters not whether it is cash rent or share rent if the landlord and tenant are right they can fix the conditions in either case so both will come out right, but what I arose to say is this, that an Illinois' Farmers' Institute is just like a Wisconsin Farmers' Institute; we have listened to a most excellent paper but the fellows the paper intended to hit, the sharp keen landlord and the shiftless renters, are not here to receive it.

The convention of delegates met as per the following call in Coliseum at 5:00 o'clock P. M. J. H. Coolidge, chairman; A. B. Hostetter, secretary:

CONVENTION OF DELEGATES.

The Convention of Delegates of the Illinois Farmers' Institute for the election of directors for the even numbered Congressional districts will be held in the Coliseum, Bloomington, Illinois, Tuesday, February 24, 1903, at 5:00 o'clock p. m.

The delegates from the several county farmers' institutes will meet at the above named time and place to elect directors of the Illinois Farmers' Institute for the even numbered Congressional districts. Only duly accredited delegates will be allowed to vote. Voting by proxy not admissible.

The committee on credentials of delegates reported as follows:

BLOOMINGTON, ILL., Feb. 24, 1903.

To the Convention of Delegates of the Illinois Farmers' Institute:

We, your committee on credentials, beg leave to report that we have examined the credentials of the several delegates of the Second, Fourth, Sixth and Eighth Congressional districts, and find the following named persons entitled to seats in this convention: James Frake; C. P. Reynolds and Merrill K. Sweet.

Respectfully submitted,
H. D. HUGHES,
E. WILLMARTH,
F. C. GOODNOW,
Committee.

BLOOMINGTON, ILL., Feb. 24, 1903.

To the Convention of Delegates of the Illinois Farmers' Institute:

We, your committee on credentials, beg leave to report that we have examined the credentials of the several delegates of the Tenth Congresional district, and find the following named persons entitled to seats in this convention: R. C. Chittenam, D. M. White and H. D. Hughes.

Respectfully submitted,
H. D. HUGHES,
E. WILLMARTH,
F. C. GOODNOW,
J. W. BECKER,
Committee.

Bloomington, Ill., Feb. 24, 1903.

To the Convention of Delegates of the Illinois Farmers' Institute:

We, your committee on credentials. beg leave to report that we have examined the credentials of the several delegates of the Twelfth Congressional district, and find the following named persons entitled to seats in this convention: Emmett Willmarth, Geo. Hyde, B. F. Wyman, Miles A. Clark, Mrs. Jennie M. Wheeler, G. A. Tullock and W. L. Frisby.

Respectfully submitted,

H. D. Hughss,
E. Willmarth,
T. C. Goodnow,
J. W. Becker,
Committee.

Bloomington, Ill., Feb. 24, 1903.

To the Convention of Delegates of the Illinois Farmers' Institute:

We, your committee on credentials, beg leave to report that we have examined the credentials of the several delegates of the Fourteenth Congressional district, and find the following named persons entitled to seats in this convention: S. S. Chapman, W. H. Ashdow, E. N. Cobb, George A. Lowden, F. A. Wood, J. B. Litterington, L. B. Clark.

Respectfully submitted,

H. D. Hughes,
E. Willmarth,
F. C. Goodnow,
J. W. Becker,
Committee.

Bloomington, Ill., Feb. 24, 1903.

To the Convention of Delegates of the Illinois Farmers' Institute:

We, your committee on credentials, beg leave to report that we have examined the credentials of the several delegates of the Sixteenth Congressional district, and find the following named persons entitled to seats in this convention: C. C. Pervier, W. B. Mills, O. H. Roberts, Henry Grieseman, Bertha Groff, G. G. Saberhill, H. A. Winter, J. A. Williams, Ira Cottingham, Wm. Oakes, A. J. Robinson, M. J. French.

Respectfully submittd,

H. D. Hughes,
E. Willmarth,
F. C. Goodnow,
J. W. Becker,
Committee.

Bloomington, Ill., Feb. 24, 1903.

To the Convention of Delegates of the Illinois Farmers' Institute:

We, your committee on credentials, beg leave to report that we have examined the credentials of the several delegates of the Eighteenth Congressional district, and find the following named persons entitled to seats in this convention: J. W. Adams, J. P. Bowman, A. H. Yanceway, C. W. Cure, D. H. Shank, Robert Hobson, E. M. Wright, E. J. Viall, V. E. Beedy, Robert Bines, Geo. W. Hobson, W. W. Rothgeb, G. H. Gordon.

Respectfully submitted,

H. D. Hughes,
E. Willmarth,
F. C. Goodnow,
J. W. Becker,
Committee.

BLOOMINGTON, ILL., Feb. 24, 1903.

To the Convention of Delegates of the Illinois Farmers' Institute:

We, your committee on credentials, beg leave to report that we have examined the credentials of the several delegates of the Twentieth Congressional district, and find the following named persons entitled to seats in this convention: Wm. Greenwell, C. L. Wood, J. W. Virgin, Frank Fulkerson, J. W. Becker, J. R. Fulkerson, G. H. Weiner, C. A. Hartzell, G. G. Hobbing, O. J. Blood, G. C. Gibson, A. M. Hulett, E. F. Joy, James Rough, Chas. S. Doyle, Geo. W. Woodall, A. S. Archer, Chas. Temple, J. A. Glenn, Will H. Young, J. K. Farrelly, F. D. Moulton, Peter A. Brown, Chas. S. Beggs and Robert Means.

Respectfully submitted,

H. D. HUGHES,
E. WILLMARTH,
F. C. GOODNOW,
J. W. BECKER,
Committee.

BLOOMINGTON, ILL., Feb. 24, 1903.

To the Convention of Delegates of the Illinois Farmers' Institute:

We, your committee on credentials, beg leave to report that we have examined the credentials of the several delegates of the Twenty-second Congressional district, and find the following named persons entitled to seats in this convention: Frank Troeckler, J. S. Culp, A. A. Hinkley, L. A. Spies, Henry Wolf, Conrad Korner, John Schneider and L. F. Dintlemen.

Respectfully submitted,

H. D. HUGHES,
E. WILLMARTH,
F. C. GOODNOW,
J. W. BECKER,
Committee.

BLOOMINGTON, ILL., Feb. 24, 1903.

To the Convention of Delegates of the Illinois Farmers' Institute:

We, your committee on credentials, beg leave to report that we have examined the credentials of the several delegates of the Twenty-fourth Congressional district, and find the following named persons entitled to seats in this convention: J. B. Smith, John T. Campbell, Ben Hogle, Laren Jack, M. E. Shurtleff, C. W. Woodhan, John P. Stelle, J. F. Buckner, W. T. Cockrell, J. F. McCartney, C. W. Hansman, Frank Sutherland, S. E. Vaughn, Laren Floyd, Arch Roberts, Dan Berry, Henry Huitt and W. G. Davis.

Respectfully submitted,

H. D. HUGHES,
E. WILLMARTH,
F. C. GOODNOW,
J. W. BECKER,
Committee.

There being no objections the report of the committee was adopted. The delegates from the even numbered Congressional districts met and reported the election of directors as follows:

BLOOMINGTON, ILL., Feb. 24, 1903.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Second Congressional district beg leave to report that they have selected Mr. B. R. Pierce of 562 Forty-fifth street, Chicago, to act as director of the Illinois Farmers' Institute for the Second Congressional district for the ensuing term.

Respectfully submitted.

C. P. REYNOLDS, *President.*

MERRILL K. SWEET, *Secretary.*

BLOOMINGTON, ILL., Feb. 24, 1903.

To the Convention of Delegates to the Illinois Farmers' Institute:

The delegates of the Fourth Congressional district beg leave to report that they have selected Mr. W. Malcom Manley of 828 West Forty-third street, Chicago, to act as director of the Illinois Farmers' Institute for the Fourth Congressional district for the ensuing term.

Respectfully submitted,

C. P. REYNOLDS, *President.*

MERRILL K. SWEET, *Secretary.*

BLOOMINGTON, ILL., Feb. 24, 1903.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Sixth Congressional district beg leave to report that they have selected Mr. F. C. Rossiter of Chicago to act as director of the Illinois Farmers' Institute for the Sixth Congressional district for the ensuing term.

Respectfully submitted,

C. P. REYNOLDS, *President.*

MERRILL K. SWEET, *Secretary.*

BLOOMINGTON, ILL., Feb. 24, 1903.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Eighth Congressional district beg leave to report that they have selected Mr. John M. Clark of 71 West Monroe street, Chicago, to act as director of the Illinois Farmers' Institute for the Congressional district for the ensuing term.

Respectfully submitted,

C. P. REYNOLDS, *President,*

MERRILL K. SWEET, *Secretary.*

BLOOMINGTON, ILL., Feb. 24, 1903.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Tenth Congressional district beg leave to report that they have selected Mr. H. D. Hughes of Antioch to act as director of the Illinois Farmers' Institute for the Tenth Congressional district for the ensuing term.

Respectfully submitted,

R. W. CHITTENDEN, *President.*

D. M. WHITE, *Secretary.*

BLOOMINGTON, ILL., Feb. 24, 1903.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Twelfth Congressional district beg leave to report that they have selected Mr. B. F. Wyman of Sycamore to act as director of the Illinois Farmers' Institute for the Twelfth Congressional district for the ensuing term.

Respectfully submitted,

E. WILLMARTH, *President.*

GEO. F. LULLOCK, *Secretary.*

BLOOMINGTON, ILL., Feb. 24, 1903.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Fourteenth Congressional district beg leave to report that they have selected Mr. E. N. Cobb of Monmoth, Warren Co., to act as director of the Illinois Farmers' Institute for the Fourteenth Congressional district for the ensuing term.

Respectfully submitted,

F. A. WOOD, *President.*

WM. H. ASHDOUN, *Secretary.*

BLOOMINGTON, ILL., Feb. 24, 1903.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Sixteenth Congressional district beg leave to report that they have selected Mr. Ralph Allen of Delavan, Tazewell Co., to act as director of the Illinois Farmers' Institute for the Sixteenth Congressional district for the ensuing term.

Respectfully submitted,

J. S. WILLIAMS, *President.*

H. S. GRIESEMERS, *Secretary.*

BLOOMINGTON, ILL., Feb. 24, 1903.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Eighteenth Congressional district beg leave to report that they have selected Mr. George W. Hobson of Vermilion Co., to act as director of the Illinois Farmers' Institute for the Eighteenth Congressional district for the ensuing term.

Respectfully submitted,

F. I. MANN, *President.*

GEO. H. GORDON, *Secretary.*

BLOOMINGTON, ILL., Feb. 24, 1903.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Twentieth Congressional district beg leave to report that they have selected Mr. A. P. Grout of Winchester, Scott Co., to act as director of the Illinois Farmers' Institute for the Twentieth Congressional district for the ensuing term.

Respectfully submitted,

C. S. DOYLE, *President.*

GEO. H. WIEMER, *Secretary.*

BLOOMINGTON, ILL., Feb. 24, 1903.

To the Convention of Delegates of the Illinois Farmers' Institute:

The delegates of the Twenty-second Congressional district beg leave to report that they have selected Mr. E. M. Burroughs of Edwardsville, to act as director of the Illinois Farmers' Institute for the Twenty-second Congressional district for the ensuing term.

Respectfully submitted,

A. A. HINKLEY, *President.*

CONRAD KOLMER, *Secretary.*

BLOOMINGTON, ILL., Feb. 24, 1903.

To the Convention of Delegates of the Farmers' Institute:

The delegates of the Twenty-fourth Congressional district beg leave to report that they have selected Mr. Israel Mills of Clay City, to act as director of the Illinois Farmers' Institute for the Twenty-fourth Congressional district for the ensuing term.

Respectfully submitted,
J. F. BUCKNER, *President.*
W. T. COCKERILL, *Secretary.*

There being no further business the convention of delegates adjourned.

J. H. COOLIDGE, *President.*
A. B. HOSTETTER, *Secretary,*

TUESDAY EVENING SESSION—7:30 O'CLOCK.

Mrs. S. Noble King in the chair.

Chairman—Before we commence our exercises this evening, I want to bespeak the very close attention and quietness of everyone in this house. From former experience here I know it will be difficult for Mrs. Howie to be heard in the back part of the room unless there is an effort to be quiet. We take it for granted that everyone came here to hear and it is only fair to give them an opportunity of doing so. If it becomes necessary for anyone to leave the room I ask you to do it just as quietly as possible, to avoid moving from place to place and especially to avoid keeping the door swinging as the voice goes out.

We are peculiarly fortunate this evening in having with us a woman from a neighboring state who is interested not only in the Domestic Science, one branch of the farmers' institute work, but also in the institute itself. Mrs. Howie, of Wisconsin, is a dairy woman, she is very much interested in Jersey stock, she is also very much interested in institute work along the line we are working. I have great pleasure in presenting to you Mrs. Ada F. Howie of Elm Grove, Wis., who will speak to us on the subject of "Home Making."

MADAM CHAIRMAN, LADIES AND GENTLEMEN—For many years we have had farmers' institutes and have, with more or less profit, discussed the most desirable methods of breeding and rearing live stock, the best ways to plant, cultivate and harvest various crops; and numerous other subjects of interest and value to our line of work. But during all this time only an occasional talk meagerly bearing upon that most important topic of farm life has been heard. Now it seems to me that the farm is the ideal spot on which to build a home, just as the broad spreading elm, oak or maple is the most fitting place for nestling birds. And while I might speak enthusiastically of the poetical and artistic side of farm life, I have no wish to dwell on these phases, because I sincerely believe that if we give careful thought and attention to the little practical things that have so weighty an influence on the happiness and comfort of our loved ones, the aesthetic features will soon follow, on the same principle as "look after the pennies and the dollars will look after themselves."

It is an undeniable fact that the most of us put too much labor and not enough sentiment into our lives. We look upon endearing words and gentle, thoughtful courtesies used in the family circle as superfluous to every day life and practice, when, if rightly applied, they prove a healing balm for tired bodies as well as bruised hearts. We count our cattle and reckon their money value before we consider their keeping and development as a sacred trust. We measure our grand old forest trees by the cord and cooly estimate the gain by their ruthless destruction, rather than bend our heads in awe before the mysteries of nature's greatness. Familiarity has bred contempt and one of the finest attributes of human nature, that of appreciation, has been starved and dwarfed by a surfeit of blessings.

In passing through the country one may see from the car window many a weather beaten farm house with not a tree, vine or shrub to mark it as the home of refined, interested people. The door yard will be untidy and littered with unsightly objects, the outbuildings filthy and the cattle scrawny and wild-eyed; farm implements carelessly left unprotected from sun and rain in field or yard. Can one wonder that such a picture does not prove alluring, and that such a dwelling passes for no more than a shelter, even to a farm born generation whose tendency to discontent is frequently encouraged, rather than uprooted, by the methods and teachings of slovenly short-sighted parents?

A pathetic wail has gone forth throughout the length and breadth of the land, "What can we do to keep the boys on the farm?" Before attempting to answer, may I ask what we have ever done to make farm life congenial and attractive to our young people? Have they ever heard aught from us of a laudatory nature concerning our calling? Have not we farmers placed a stigma on our own occupation by holding up the defects instead of the praiseworthy qualities, by impressing upon the young minds the idea that farm life and labor was degrading; that there was neither profit nor satisfaction in the business and that in the nearby or distant city could be found more respectable and attractive modes of earning a competence? Yes we have woefully belittled our own calling in an attempt to magnify the greatness of others. In a mudling self abnegation, we have said to our children, "Our lives have necessarily been lives of self-denial and drudgery. We will still work our fingers to the bone that you, who are too good for this labor, may have the advantages of broader education. John shall be a lawyer, a doctor or merchant and with good clothes and polished manners, occupy a higher position in the esteem of his fellow man."

In planning for an ennobling mental and physical development why not educate John in the same line of business his father has followed? Let him go forth and study the improved methods of agriculture that with his practical training and newly acquired knowledge he may help the old farm to keep pace with modern science and skill. Teach him there is no more dignified, honorable or wholesome way of earning a livlihood than by forming a partnership with the forces of nature. Do not hold up before his young eyes the almighty dollar as a scale by which to measure the length and breadth of success. Impress upon his youthful mind that the results of conscientious thought and toil will daily gain in force and influence while the minted coin diminishes in value by constant circulation.

Mary shall be given accomplishments. She shall be taught music, painting and art needlework in order to make her so attractive that she may marry well. What is the meaning of marrying well? Is it to give our daughter to the dissipated son of some rich man who is eagerly waiting for his father's death that he may spend in riotous living the money accumulated in a lifetime of labor; that by neglect and indifference he may break her heart and ruin her life?

Is it for this that we toil and save and scheme? When a little girl I used to diligently copy after a form written by my teacher "Be good and you will be happy." No doubt many mothers and fathers schooled in that day faithfully traced the same lines and do you know, I believe it is owing to that sentiment that we have made this great mistake. We thought if we sent our children to church and Sunday school, if we prayed over them and devoted our lives to what we believed to be their best interests, we were carefully following out the instructions of our early training, and we never questioned the wisdom of the motto that to us had become a law. And yet, it was a big mistake, what should have been written is, "Be useful and you will be happy." That is a sentiment we may safely hand down through the ages.

Let us teach our children by both precept and example the true dignity of labor. Let us teach them that no honest work is degrading, that the only disgrace is the manner in which it is performed. Let us teach them to love and revere the farm and farm life; that their hearts should ever be filled with gratitude to God that he has given them broad acres rather than a tiny patch of ground; that he has entrusted His lowly creatures to their care and that they may with earnest solicitude study so well the requirements of this great trust that when an accounting shall be called for the response will eagerly be:

Here are the talents, Lord Thou gavest me,
  Not idly hidden in the earth away,
But scattered o'er the broad and sun flecked lea
  To grow in beauty's strength from day to day.
These soft eyed kine entrusted to my care
  To lead with love, not by the flaming sword,
I bring with faith that Thou wilt deem them fair,
  All, all are Thine and I thy herdsman, Lord.

Either by design or unconsciously we have held up a wrong standard for our loved ones to follow. We have taught them to regard money and position above character and worth. We weak, foolish and ambitious mothers in our desire to uplift our daughters in the esteem of a frivolous society, have stamped upon their childish, impressionable minds the belief that the practical duties of home-making, the things that represent so much in the welfare and comfort of our dear ones, are beneath the best efforts of an intelligent and self-respecting woman.

Why, it is the heaven born mission of woman to be a home-maker. From the time as a wee toddling girlie she hugs her dollies and plays at housekeeping with bits of broken china, the home-making trait is strong within her, and if we succeed in diverting her natural instinct we will have blotted out the sweetest, most lovable and noblest characteristic God has given to woman. Let us teach her that if she possesses the dignity of self-respect, others will respect her. Let us hold up the high ideals of thoroughness, system and order in the curriculum of exalted home-making. Let us teach her that there is an art and science in cookery, dish-washing and scrubbing. Don't say "Mary I'll wash the dishes, it will make your hands coarse and red. You go and practice, I'll attend to the kitchen." Teach her the neatest and most thorough way to do the work. Why, do you know, there is not one woman in 50 who knows how to properly wash dishes.

Let her feel that you depend upon her assistance. Let her see that you take pride and pleasure in your kitchen and utensils best suited to the convenience of doing superior work. An ample sized and well made dish pan is more to be desired than a plush album in the parlor. Don't say, "Mary go and dress up. Some one may come in and it won't do to let them see you in your working clothes." Teach her to look tidy at all times; that she is as much a lady in print as in silk; to meet company without embarrassment, even though she holds a scrubbing brush in her hands and her sleves are rolled to the shoulder. Teach her it is far better to darn a stocking neatly than to injure her eyesight making fancy work. In short teach her so thoroughly and well the practical accomplishments that rightfully belong to the higher education of the housewife, that she will prove a blessing and helpmeet to the fortunate man, be he rich or poor, whose name she may some day bear. In this way we may build a substantial foundation for her future happiness.

Supposing an architect was to erect a beautiful palace by beginning at the cupola, adding ornamental bay windows with elaborate filagree work here and there, and then place the structure on posts, no foundation to this magnificence. The result is quite apparent. He would receive and deserve the scathing criticism of those who passed by. Undoubtedly they would remark: "Look at all that filagree nonsense and no foundation. Surely the builder had more ambition than sense." Let us first build a solid foundation for her future usefulness as a home-maker and then add the less essential features of music and art to her education. What is education? Is it a little book learning too often acquired at the expense of hand and heart? The best and truest education is the knowledge gained where heart and hand and heart and brain have been developed in unison and such wisdom used for the benefit of all mankind. We are riding our educational hobby too fast and the unmistakable wood is exposed every time the lash of progress chips from its flank the gaudily painted dapples.

Let us turn back the hand of time and more carefully regulate the pendulum. Yes, even to the days of our great grandmothers, if need be, to an age when women baked and brewed, spun and wove, cooked and sewed and did not lose cast by doing cheerfully and faithfully the manifold duties that by right of dower fell to the mistress of a home and family.

A little more than a year ago it was my good fortune to be installed for a few weeks in one of those dear old New England homes. My room was picturesque in the quaintness of furnishings belonging to a by-gone period. The bed linen was exquisite with needlework and on inquiry I learned that it had been a part of the maker's wedding outfit. And although the hands that had set each stitch with such exact precision had been folded beneath the Green Mountain turf for more than half a century, one might still read in this dainty handiwork the character of a refined, gentle and lovable woman who had nobly filled the niche in which her devoted family had enshrined her as a home-maker.

Why not take pride in handing down from generation to generation this womanly accomplishment that the exquisite needle work of our ancestors, the hemming, felling and stitching, may not become a lost art.

Yes, let us raise a few generations of home-makers, rather than the strong minded, ambitious self-supporting girls, who in the hand to hand struggle of bread winning become heart hardened and aggressive. Look out for number one is the precept laid down for them to follow, and by so doing they grow skeptical and selfish. Look out for the welfare and comfort of those about you and take no thought as to the fate of number one is the counsel that will come from the gentle heart and lips of a wise mother. Why, it is like looking into a mirror, what you give to others will quickly reflect. No, she need not look out for number one, let her best efforts be used for the betterment of he dear ones, and I promise your number one will in no wise suffer.

A quarter of a century ago it was not unusual to see brides of 16 and 17 years. And while today we have just as sweet, just as lovable and attractive girls, you may find many at 28 and 30 who have never received a proposal. Why is it?

Well, in spoiling our daughters we have also harmed our sons. We have taught them to admire the stylishly dressed girl; the girl with a few superficial accomplishments, who oftimes in a longing for luxuries beyond her means grows restless and discontented. The average young man who must make his own way in the world quickly arrives at the conclusion that without an abundance of money or high social position it would be utter folly to attempt to make such a girl satisfied and happy. Therefore, he assumes an indifferent air; talks lightly of matrimony; has it understood that he is not a marrying man although fond of woman's society. The money that he might have put by for the purpose of building a modest home is used selfishly and extravagantly in an attempt to keep up an appearance of social standing. He cultivates an egotistical belief that all the young women of his acquaintance must regret his determination to be a lifelong bachelor. One evening he will favor Mary with his company. He will explain that Mary is a delightful companion. She can play rag music and sing coon songs too cute for anything. The next evening he will devote his time to Kate. She is a delightfully sweet and dignified girl, plays the mandolin and talks entertainingly of prehistoric art. Yes, she is perfectly charming. But, after sober reflection he doesn't care to risk injuring his digestion by eating the cooking of either of these girls.

Now, girls I am going to tell you in strict confidence how to get a good sensible husband and then, if he prove worth the effort, how to keep him constant and content throughout all time, for the saddest thing in the world is, when a woman has once won the love and respect of a good man, to have it slip away from her through either her own carelessness or ignorance.

First of all, lay well the foundation of a perfect homemaker by learning to be a good cook, a systematic and tidy housekeeper, an excellent needle woman who understands the art of darning and mending for "A dollar saved is a dollar earned," and by painstaking care in this direction you may almost double a man's income. When you feel yourself so thoroughly proficient in these accomplishments that you may unhesitatingly take your place beside the man you love as his helpmeet to encourage and assist him on the road to greatness and prosperity, you stand ready to fill the sacred mission for which you were intended.

Now, did you ever see a man catch a colt? He puts some oats in a little pan and goes to the field where he stands quietly and shakes the pan until the colt hears the rattle of the oats and comes prancing up. But the man never runs after the colt, and don't you ever run after a man. When the colt becomes interested in the oats the man slips the halter over its head and leads it away. But sometimes, even after the halter is safely fastened the colt will rear and plunge and if the man does not hold firmly to the strap it will break away and the task of bringing him back will be more difficult than before.

Now, put these housewifery attractions in a pan as it were, and while standing in your father's doorway shake the pan—(the safest place a young girl ever stood is under the shelter of her father's roof). The young man will hear the tinkle, for the novel sound will echo far and wide. Such rumors as Mary Jones is a remarkable girl, such agreeable manners, such a model housekeeper; a wonderful help to her mother; why her parents couldn't do without her, will go floating through the air, and men are queer creatures, whenever they hear that someone has something that they cannot spare they're bound to possess it. And in all probability more than one young man will have a longing to claim for his wife so capable a companion as Mary Jones.

Now, should a young man come whose love you cannot return, remember that in tendering you his heart and name he has offered you the greatest honor a good man can confer upon a woman. If you do not love him, do not lower yourself in his estimation by refusing him and then going about saying, "I could have married John Smith but I didn't want him." Let your lips be sealed, regard his confidence as sacred, for if you do not love him you can at least respect him, and never for a moment let him feel that he has made a mistake in thinking you worthy of honorable love. But when the right one comes, the one you can gladly say you will "love, honor and obey" there will be no fear of poverty. If you are a true type of American womanhood, you will staunchly and proudly take your place by his side, feeling it a privilege to be in every sense the helpmate that may nobly win the right to receive a royal share of credit for his ultimate success.

Some, many, think that in order to have an attractive home it will require a large outlay for a suitable building and the necessary furnishings. Don't make a mistake. The most beautiful home I was ever in was a little log house of but one room and a shed. It was so exquisitely clean, and after all true elegance is thorough cleanliness. Fifty dollars would have bought every bit of furniture it contained, including the bed and cook stove, and yet it was amply furnished; the most artistically fitted up home I have ever seen. Every article was for use and was held dear from association. The floor was scrubbed white so that no one would have ventured to step within until he had first wiped his feet on the husk mat that Margaret had woven with her own hands. There was a braided rug upon the floor, and an old-fashioned rocker with a feather cushion. On the little log window sill was a pot of plants that Margaret had brought from her eastern home and the snowy muslin curtains were bits of her wedding dress. There was a cherry picture on the wall and a mending basket that gave an added charm to the room.

I don't believe that John ever put on a pair of socks that had not been darned with all the painstaking care given to the finest embroidery. There was a little pine table, so fair and spotless that I used to wonder if it would melt away into fairyland should I put my childish finger on it. And above the table were some little shelves—put there by John—to hold the few dishes they owned. Do you think Margaret carelessly dumped those dishes in a pan and hastily banged them about regardless of nick or crack? No, she handled them with tender care. She was John's faithful, loving wife and well knew they could not afford to waste money replacing things broken by carelessness. Nor did she wish to see their table, however plain, made poorer or unsightly by chipped and blemished ware.

And there was dainty refined Margaret and sturdy John, who had in no wise ceased to be a lover while bearing the title of husband. Yes, it was the most beautiful home I have ever seen, for it contained the necessary elements to make it such. There was cleanliness, system and order. There was unselfishness, contentment and love. What more do you want? With these elements you can make an acceptable home out of a dry goods box. I have since been in a number of beautiful dwellings where there was marble and tiling, elaborately carved wood and artistic frescoing, antique rugs and luxurious furnishings, rich draperies and magnificent paintings, rare bric-a-brac and exquisite statuary, but I have never been in a home that left so marked an impression upon my heart and brain as did that little pioneer hut on the border of an Iowa prairie.

In furnishing a home we farm women too often seek to imitate a style quite unsuited to our conditions and surroundings. For instance, the large, heavy carpets, that in the city would be sent away to be cleaned, would prove a formidable tax on woman's strength, and it would indeed be a brave housewife whose courage would admit of asking assistance from the men during the stress of spring work. Hardwood and painted floors with rugs of a size easily handled are more in keeping with farm conditions. Deeply tufted upholstered sofas and chairs will require a vast amount of time and patience to keep in a pleasing state of freshness while easy chairs mith movable cushions are more inviting and require far less attention. Good books and pictures will be the first consideration in a cultured home, and the occasional purchase of a thoughtfully selected volume is a wise and profitable investment. A well-ventilated sleeping room, provided with the customary toilet necessities with a simple iron bedstead and roomy washstand is more desirable than a stuffy apartment containing a massive set and a shortage of towels and soap. If comfort and convenience be considered paramount to magnificence, we will make fewer mistakes in selecting our furnishings.

When one possesses a husband and home, she should bear in mind that it matters not how glowing a fire one may kindle, that, if it would be kept burning, fuel must be added from time to time. And so it is with the fires of love. If treated with indifference and neglect they will soon smoulder to ashes.

Therefore, if you are a wise woman you will from the start plan a practical course by recognising the fact that no man is an angel, consequently do not expect too much. And if you would make his home attractive more than any other place look well to his physical comfort. See that his meals are carefully prepared and served on time. You know you deceived him when you made him think you the dearest, sweetest girl on earth. Now keep up the delusion. Never let him suspect that you are not. I have seen just an ordinary little woman, who didn't know much, (you don't have to know much, men, as a rule, are content to know it all) fool her husband for 30 years and even longer, and he'd never found out that she wasn't the sweetest, smartest and most lovable woman in the world.

I have actually known a woman of this kind to give her husband so good an impression of the sex, that if he lost one wife he wouldn't hesitate to marry again. You can do this if you only try, why, you can wind a man around your little finger and he'll never be the wiser. Men are dependent creatures. Did you ever see one with a missing button or something gone wrong with his suspenders? "He'll go calling through the house. "Mother, Mary come quick, I've lost a button!" Now's the opportunity to show him you're the most wonderful women on earth, for whenever a man sees another do something he can't do, he thinks it marvelous. Put on your thimble and sew that button good and firm, while you casually remark that you don't know how he ever managed to get along without you. And he'll wonder that he ever did. O, you can fool them in a hundred loving little ways. Men like petting and many of them have been used to it, for if there is anything dearer to a mother's heart than her girls, it's her boys.

If you are a wise woman you'll never let him miss his mother's sympathetic encouragement and approval. Remember that what is for his interest is for yours, and that he can work better and harder when he hears your cheery words of approbation ringing in his ears and knows he will be welcomed by your happy smile.

Make yourself a necessity to him and take advantage of his every weakness. Men are conspicuously vain. Why, a woman's vanity is nothing compared to that of man. Praise his every commendable effort. It will spur him on to greater achievements. Go out to the barn and show an interest in the cattle. Commend his manner of feeding pigs. Jolly him up a bit by drawing flattering comparisons between his and his neighbor's methods. Yes, take a loving interest in everything on the farm. The barns will be sweeter and cleaner by your presence; the cows will be more tenderly cared for and you will be so rich in joy that a more sordid ambition will be forgotten.

But there are three things you must not do if you would keep your husband's love and respect. You must not complain, you must not find fault and you must not nag him. If you have a trifling headache never say, just as he is starting to his work, "John I don't feel well." It will put a damper on his best efforts. Women were born to make believe and you can smile even if you are not feeling quite right, until he has left the house. Then if it is any benefit to yourself do yourself up in camphor and groan to your heart's content. If you are really ill go to bed and call a doctor and you will then know the sweetness of a tender sympathy. John will exclaim: "Bless me the dear little woman must be sick for she never complains," and he will undoubtedly do all in his power to restore you to health.

And do not find fault when he is making every effort to succeed. Do not paralyze his ambition by saying: "John, I was over at neighbor Smith's and they have got a new carpet and a rocking chair and a picture and are going to have their parlor newly papered, and I do not see why we cannot have such things. We are just as good and I work just as hard as Mrs. Smith. There must be something wrong with your management; I don't think you are very ambitious." O, if you value your happiness don't do it. Can't you see you are pushing him away from you. Never for a moment let your husband see that you have lost faith in his ability. Though he fail in many schemes, encourage him to try again. Though all the world loses confidence in him, if he is an honorable man, never let him know that you are disappointed or that your trust has wavered.

I'll tell you what to do. Put your arm around his neck and say cheerily: "John, dear, do you know what those foolish Smiths have done? They've bought a carpet and a patent rocker and a lot of truck and now they will have to care for it. I'm so thankful we have more sense. When we have money to pay for such trash we will buy a cow." You may punctuate this with kisses if you like and John will think was there ever on earth such another sensible little body. O, you can fool them to the end, if you only understand your business.

And, above all, don't nag. A constant nagging will break the spirit of any man. You may have a temper (some women acquire one by inheritance) but you never allow him to see the ugly side of it before you are married, and don't do it now. If you feel you must give vent to it, wait till he is gone, then grit your teeth, take a good solid chair and shake it furiously. You can make believe it's John and no harm will come to the delusion your husband is laboring under. John, all unconscious, will very likely be heard bragging about the even disposition of his wife. Still, if you are unable to control your temper, if you must give John a piece of your mind, have it out in a hand to hand conflict if need be. It may clear the atmosphere like a thunder storm. Still, I wouldn't advise it, but its better than nagging. Whatever you do, don't nag.

The usual monotonous round of indoor work is broken all to smithereens by the occasional appearance of one or more guests, for while some town-bred people shrink from the responsibility incident to rural life, they are not unmindful of its summertime attractions. And when spring buds and blooms are beckoning in tantalizing fascination the temptation to make a raid on some nearby farm house becomes so irresistable that a cherry voice will be heard calling to a neighbor: "It's a lovely day. Don't you want to take a drive into the country. I know a farmer who lives a few miles out. They're farmers, but they're nice people," is hastily added by way of apology for so obscure an acquaintance. "They own a big farm and have lots of cows, sheep and chickens. Don't you want to go? Pshaw, they won't mind if you are a stranger. They'll be tickled to death to see us. Bring the children and we'll have a fine time." Did you ever, right in the midst of house cleaning, when you were struggling to gain time by having a picked up dinner, look out and see a load of jolly, daintily dressed city people drive up to your door? Did you? And did you wring your hands in despair at the meagerness of the family larder as it flashed through your startled brain? No pie, no cake, no seasonable delicacy on hand, and then go forth hospitably to meet them and say "I'm so glad to see you," and at the same time feeling yourself the old hypocrite that you so heartily despise?

Now I beg of you don't put those people in a stuffy parlor and offer them amusement in the shape of the family album. They don't care a rap for the pictured faces of "your sisters, your cousins or your aunts." They may take a passing interest in the veil-decked bride or the chubby infant, but it won't add to their good opinion of the restful side of farm life to have you rush to the kitchen and baking and stewing until your strength is exhausted and your nerves all aquiver. Don't let them carry back to their home in the city the impression that you are an ignorant drudge whose sole conception of hospitality is an overloaded table and an apologizing hostess.

There are refined, thoughtful people, who live in cities, who do not come to you for a meal. They can buy that. But they do come longingly to the farm for what is priceless. They come for the peace and quiet and rest and comfort that country life affords. They come to fill their weakened lungs with that rare oxygen of which we have so much to spare. They come to be in closer touch with Mother Nature and to lay their weary heads upon her soothing bosom, to learn something of her wondrous secrets and for a time to break loose from the galling chains of formality.

Now don't give them the idea that farm life dwarfs the intellect. Greet them with a cordial welcome. Let them see that while you may know naught of the latest social fads you are quite familiar with every phase of your calling. Give them a part of yourself and a share of your wisdom. Take them to your clean barns, show them your gentle cattle and call their attention to the individual merits of your stock. You may be able to quite astonish them with the glibness by which you can tabulate the pedigree of a favorite cow. Have a dignity and pride that will serve to point to the uplifting character and attractive features of your profession rather than assume a bearing that will tend to accent its defects.

If you are the good housewife you should be, your bread and butter will be wholesome and palatable. If you have tea and coffee well and good, if not, perhaps you have milk, in case of a shortage in this liquid there is water. Your table should at all times be clean and it will require but a moment to lay the extra plates. Now ring the bell or blow the dinner horn; call in the men. It will not be neecessary to offer an explanation for having your help eat at the same table. Your guests will readily understand that it is your usual custom, and one best suited to your conditions. Have a dignity and manner of your own and it will be respected, Do not strive to imitate ways unsuited to your means or mode of life.

Yet, I have known of cases where fathers and mothers had toiled and saved and planned all the best of their lives in order to give their children advantages of which they themselves had been denied. They had sent them to academy or college to obtain the education that should prove a potent passport to the esteem of all men, and these young people had returned vainglorious enough to feel the knowledge acquired had raised them superior to those who through long years of self-denial had made this educational training possible.

I have known these young men and women when entertaining some college friend to say: "Let's get father to wait." Perhaps father likes to eat in his shirt sleeves, or with his knife. Well, what of that? Isn't it father's home? And such breaches of etiquette are mere trifles compared to the sneaking ingratitude of a nature that would postpone a father's meal in order to cater to the good will of a stranger.

Now is the time to show father the true value of a creditable education. Let him see that the money obtained by many sacrifices on his part was not misapplied; that it has helped to make a man of you and not a contemptible snob. Place him at the head of the table with the unmistakable air, you are honored today by being permitted to eat with my father.

The man or woman, young or old, who is too good to sit at father's table and eat father's bread in father's house and in his company is not the person for you to cultivate. Cut the acquaintance at once and let your aim in life be to move in a better grade of society. It may be your father's clothes are not of the latest cut, possibly they are sunbleached and shiny at the seams. Still if you will stop to think he may have been so occupied in his efforts to pay the bills for your improvement that there was little time for thought of his own apparel. Remember this and that your filial obligation is a lasting debt of gratitude. See that it is paid in full and with usury, for if his own son does not show him deference you cannot expect others to do so.

The progressive farmer of today needs no urging to supply his family with abundant and suitable reading matter, therefore, the country woman may be as well-informed on both foreign and domestic subjects as one who resides in the city, and with the helpful influence of natural surroundings there is no reason why the home of the farm may not become a veritable paradise.

While the task of home-making is more generally supposed to devolve on the woman of a family, each member, great or small, should bear a responsibility and take both interest and action in preserving the dignity of home life, be it lowly or grand. Some men are utterly unconscious of the fact that they have formed an entirely erroneous idea of woman and her claims upon them. They are unable to comprehend the real nature and characteristics of the true type of an intelligent, refined woman. They do not know how to draw out and develop her finest qualities any better than some farmers understand managing a dairy cow to obtain best results.

They are laboring under the impression that all women are vain, frivolous, irresponsible creatures that should be firmly held in subjection; that if a man is unable to provide one with fine clothes, jewelry and social amusement she will soon become discontented and wretched. A greater mistake was never made. The real woman doesn't care for fine clothes, jewelry or social position. If she favors them it is only because she believes such adornment and position will make her more pleasing in the eyes of the man she loves. Women were born to make believe, and I have known them to serenely smile while their hearts were breaking. No, she does not hinge her happiness on luxurious raiment. If she cannot command something better she'll take it, just as a starving cow will eat straw when she can't get hay, but she'll not thrive and develop all the tender possibilities that lie within the fertile soil of a glorious nature.

What she does desire above all things is appreciation, love and petting. It doesn't cost anything. She'll never tell you for the woman I have in mind is too proud to beg for what rightfully belongs to her. When you have taken this girl to share your fortune of either weal or woe, when you, by your protestations of love and fidelity, have severed the ties that bound her to the home of her girlhood, when she has willingly forsaken father and mother to cling only unto you make it your lifelong study and duty to see that she never has cause to regret the step that you are responsible for her having taken.

Be patient. Remember that heretofore she has leaned upon the counsel and encouragement of her mother and now she is called upon to exercise her own judgment and skill. She'll make mistakes, she wouldn't be human if she didn't. Commend her every effort, even if the result fall short. Let her see that you have faith in her ability to accomplish all things and she'll not disappoint you. Tell her she is the neatest, most orderlv little housekeeper in the country, and you are proud to have the neighbors go through her kitchen. She'll not fail you. Tell her if she keeps improving she will beat your mother cooking. Why, man alive, she'll do it every time. You don't know of the qualities to be brought out and emphasized with a little judicious praise. Save her strength, because an ambitious little woman will place no limit on her endurance when she is bidding for the approval of the man she loves. Keep a watchful eye on her that she may not overtax her energy and if you cannot afford help there are numerous ways in which you may render valuable assistance about the house.

See to it that she has an income or allowance that is quite her own and for which she need render no account. Let her feel that you would gladly provide her with every luxury if it were within your power. Give her the chickens —you'll have a better flock of fowls—and see that she has the proper place and the needed assistance to enable her to show her skill and business ability in their management. Say to her: "The money you get from this source shall be yours without question." You'll find it will pay you well, for when taxes are due or you want to cancel a note, you won't have to go to the bank, you can borrow of your wife—she'll have it saved.

No, women are not the extravagant creatures some men think them. Give her your confidence and let her feel the blessing of your unbounded trust. Say to her: "Here is the pocket book. There are such and such payments to meet, you know what we can afford as well as I; use the money as you think best." This liberty and confidence will be its safest guard, she will never touch it without first consulting you. You'll find it all there and she will cheerfully make over her old dresses and trim her bonnets, year after year, until you begin to admire the more up-to-date clothes of some other woman.

Don't say my farm. This is a partnership affair and the proper term is our farm. Ask her advice on all business matters. If you don't see fit to follow her suggestions explain your objections and she'll be satisfied. Let her be thouroughly conversant with your business methods, then if you leave her unprotected, she will be less liable to fall a victim in the toils of unscrupulous estate adjusters.

Don't go about with your life shut and your mind occupied on matters too weighty for her comprehension. If she timidly calls your attention to the merits of some new dish or improvement, don't carelessly say: "O, it's all right, if it wasn't you'd hear from me." Such comments will crush the spirit and ambition in any woman.

Don't take it for granted that she knows you love her, tell her so. I'll give you a ration. Tell her three times a day that you love her—no roughage in this if you please. Don't tell her in an indifferent way. You know how you said it the first time, now repeat it with renewed tenderness. Three times a day is not too often and many women can assimilate to advantage a much heavier ration. Don't be afraid to use endearing terms, have a pet name for her and call her girl even if she is 60 or older. Youth and age are the times when love is best appreciated.

Don't complain that women fade and that the stylish, lively girl is too often apt to change into a morose, common-place matron, for it lies within your power to prevent this transformation. A woman's heart is a strange creation; it is a sensitive plant that sends out tiny, clinging tendrils, and if they come in contact with a cold, unresponsive barrier, they will turn and seek substance elsewhere.

Sometimes she will transfer to her children the love and devotion that would have been gladly given to her husband had she met with encouragement. Again the better part of her affectionate nature is bestowed upon clubs, charity work, educational aims or ambitious schemes. Sometimes Satan, in the guise of one who understands her nature, offers a glittering imitation of the more substantial love she craves, and if she has been taught to regard indolence and luxury above honor and industry, her situation is indeed a perilous one; but if from childhood she has been trained in a belief that humble duty conscientiously performed may bring greater reward and joy than a realized ambition. she stands serene and safe.

So long as she has the assurance of her husband's love and confidence she will never grow old or discontented. Tall sons and daughters, yes, and tiny grandchildren may mark the progress of years, but she, living in an atmosphere of love and appreciation, will remain forever young and attractive.

O, if we will but cultivate these little, tender courtesies as painstakingly as we do our grains and grasses! If we will by daily effort and example sow the fertile seeds of a spirit of industry and sincerity and appreciation in the minds and hearts of our little ones, we shall have dowered them with a higher education and a far more valuable legacy than lands and gold, for we will then surely find that all of earth and the greater part of heaven is centered right in that little spot called home.

Chairman—The next number on our program is a vocal solo by Miss Lizzie Baldwin.

Chairman—It is quite unnecessary for me to tell this audience of Prof. Eugene Davenport and what he is doing in the College of Agriculture of the State University, but I am very glad to say he is with us and will talk to us on "The Work of the Experiment Station and the College of Agriculture."

THE WORK AND NEEDS OF THE AGRICULTURAL COLLEGE AND EXPERIMENT STATION.

By Prof. Eugene Davenport Dean of the College and Director of the Experiment Station.

MR. PRESIDENT, LADIES AND GENTLEMEN—Two years ago the agricultural associations of the State united in asking the appropriation of State funds for the purpose of conducting investigations into some of the leading agricultural conditions and problems of Illinois with a view to developing the agricultural possibilities of the State. Seventy thousand dollars were asked—$25,000 for live stock investigations, $10,000 for corn investigations, $10,000 for soil investigations, $10,000 for orchard investigations, $10,000 for dairy investigations, and $5,000 for sugar beet investigations.

Fifty-four thousand dollars were appropriated, the live stock section suffer ing a reduction to $15,000, the dairy section to $5,000, and the sugar beet section to $3,000.

The investigations were undertaken at once and have proceeded strongly, except that in those sections offering reduction the experiments have been greatly hampered and necessarily confined to narrower lines than would otherwise have been necessary.

This was good legislation, and the results achieved and in immediate prospect have been so satisfactory and so manifestly beneficial to the agricultural interests of the State and the need of increased instruction has become so evident that the same associations have again united and are asking that even larger amonts of State funds be devoted to the business of investigation and instruction in agriculture.

Accordingly a bill has been prepared and is before the General Assemby. This bill is the lineal descendant of House Bill "315" of two years ago, and differs from it in but few particulars.

NEW FEATURES OF THE ASSOCIATIONS' BILL.

This new bill differs from the old one in five particulars, as follows:

1. The live stock section is exactly the same as before as the amount, viz.: $25,000, and differs only in the fact that it must all be devoted to investigation.

2. The dairy section is increased from $10,000.00 to $15,000.00 with a special mention of "field work."

3. The soil section is increased from $10,000.00 to $25,000.00 in order to cover the State more rapidly.

4. A poultry section at $5,000.00 is added.

5. A college and equipment section at $50,000.00 s added.

All other sections, viz: corn, orchard and sugar beet, remain as before.

REASONS FOR CHANGES IN THE NEW BILL.

1. The Live Stock Section—This amount stands as before, at $25,000.00, all of which is to be used for investigation. The old bill provided that a portion of these funds should be used for maintenance of specimens for the purpose of instructien. But the item was cut to $16,000.00 and it was found that, in order to do good work in investigation, but a small amount could be used for any other purpose, and that even then but limited investigations could be undertaken.

Accordingly the experiments were confined almost exclusively to beef alone. The work has been of the highest order, and has been vouched for by the advisory committee of the Live Stock Association, but it has been necessary to ignore very large and important live stocks interests.

There are but two alternatives—to use a full $25,000.00 in investigation or else limit the work to a single live stock interest, which is manifestly impolitic and unwise, if not unfair. All investigation is tremendously costly, and that of live stock particularly so.

The question is often asked: "Can you not feed cattle so as to make something, and do you need much money except to start with?"

The answer to this question, for it is an honest one, is: "Yes, we can feed cattle so as to make money on them, but these are not the methods that need investigation."

Any and all questions that can be settled without sacrificing the profits of feeding should be settled by the individual farmers themselves, and not at public expense.

The station is not organized to make money for the State. The State does not make its money through the State institutions. It makes its money by taxing private enterprises, first for protection and afterward for their development, and the State has no right to undertake at public expense questions that can be settled by individual enterprise simply because they are comparatively cheap. That would be indeed a waste of public money.

This is what makes such work expensive—costly apparatus and equipment in order to control conditions, and expensive men to guard the progress of the work and control the publication of conclusions.

Bird's-eye view of the College of Agriculture and Experiment Station Plots.

True, there are large receipts when cattle are sold. It is also true that some have been fed at a profit, but in most cases, if the experiment is valuable, others have been fed at a loss, and in all cases the expenses of feeding is a small part of the total cost. The work, therefore, cannot be conducted on receipts.

Hasty work at the hands of inexperienced men is not to be thought of. It is clearly a waste of public money, and what is even worse, perhaps it will lead to the waste of more money whenever farmers attempt to follow the lead of supposed results, in which case the appropriations damage instead of sustain the interest they were designed to develop.

The amount asked for is the minimum that will permit good work in the different lines of live stock industry. If it is cut, then the work must be confined to a narrow range, for poor work is not to be considered.

2. The Dairy Section—Last session this fund was cut to $5,000.00, and the attempt to carry on really valuable work and at the same time show results has been fraught with the greatest difficulty.

A man has been kept constantly in the field in the districts of the northern part of the State, and this has been held to be so valuable that the association made an additional asking above that of two years ago in order that this work might be extended, and it is their hope that this may be done without precluding well considered and carefully conducted investigations at the station touching some of the more difficult phases of the industry.

3. The Soil Section—The work of the two years has discovered some of our principal soil difficulties and has found ways for their treatment. The study of the principal types and classes of soils, of which there are many, has been commenced and four counties have been surveyed in connection with the general government and every different type of soil indicated in colors on a map of each county.

The acid condition of many of these soils has been shown—a condition in which nitrogen gathering bacteria will not thrive, and therefore, one in which the nitrogen supply will rapidly run down unless kept up by direct addition, which is too costly for profit.

The amount of lime necessary to correct this acidity has been determined for many of these soils. Some have been found to be lacking in phosphorus and others in potassium, and therefore incapable of maximum yields.

When every one of these different types shall have been carefully tested in the physical and chemical laboratories, by pot culture experiments under glass and by actual field trials on the land itself until the nature of that type is fully known and the best treatment is established; and then when by an accurate soil survey the exact extent and boundaries of every several type shall have been determined and accurately mapped, down to an area of ten acres—then we shall have a knowledge of Illinois soil that will make possible absolutely intelligent treatment by every land owner without special analysis of his lands, but by simple reference to the map and records of experiments. Then farmers will be saved many costly and ineffectual attempts at soil protection and many of the present wastes will be prevented.

The increase from $10,000 to $25,000 is asked in order to hasten this work and extend it to all the types and over all the counties of the State as rapidly as possible.

At the present rate of progress it would require about 25 years to cover the State. A more rapid rate is not only economical of management, but the results will be earlier and more generally available.

4. The Poultry Section—This is a new section, added at the instance of the Poultry Association. The poultry interests, though very great, have never had recognition at the Experiment Station and they claim the same privileges of development as do other and similar interests.

In this connection attention is called to the fact that the Wisconsin Cranberry Growers' Association is asking the legislature to appropriate the sum of $5,000 annually to the experiment station of that state, for experiments in cranberry growing. Are not the poultry interests of as much consequence as the cranberry interests of Wisconsin?

THE COLLEGE AND EQUIPMENT SECTION.

This is a new section, and from its size and character it requires somewhat extended treatment.

The other sections of this bill aim to provide funds to be put immediately to the work of investigation in order to learn new facts or removing difficulties under which farmers now labor in the various lines mentioned.

This section is designated to increase the facilities for instruction, to provide suitable housing for animals and additional room, made necessary by the requirements of investigation work.

Speaking generally, it is designated to provide three things:

1. Additional equipment, especially live stock for college work.
2. Buildings to be used for both college and station purposes.
3. Additional instruction to meet the increasing needs of students since their numbers have increased to nearly 300, and since they are demanding instruction in more than the 88 separate agricultural subjects now taught at the university.

WHAT IS NEEDED IN THE WAY OF EQUIPMENT.

In certain lines our equipment is excellent, in others poor, and in still others, entirely wanting. For example, we have an excellent equipment in dairying, and in farm machinery it is limited only by our ability to provide shelter, as many companies furnish machines and tools without expense to us. We have an exceptional equipment for the study of soils, and a good outfit in certain lines of horticulture.

But we have next to nothing in beef cattle, sheep, swine, and horses, except as we borrow it, or to a very limited extent buy it; for we have almost no funds for this purpose and no proper shelter for the animals if we get them. No other state is so poorly provided with live stock specimens. This is no credit to Illinois, and it cannot be different until ample funds are provided, not only with which to secure the animals, but for suitable housing as well.

Our live stock interests are second to those of no other state. We now have abundant range and there is no sufficient reason why this college should not be provided with needful material for the instruction of young men in live stock husbandry.

There can be no reason why we should longer confess to inferiority in this particular. We are in distress now and if the live stock situation at the college is not immediately relieved we shall be hopelessly distanced by states like Iowa and Michigan, that are putting generous sums into animals with which to teach live stock husbandry to their agricultural students.

WHAT IS NEEDED IN THE WAY OF BUILDINGS.

There is no more usable and efficient agricultural building both for college and station purposes than ours, and its class rooms and laboratories are crowded, even overrun in many cases both with instruction and investigation.

We have the largest and most complete system of sheds and yards for feeding car-load lots of cattle possessed by any institution. We have a twice-made-over dairy barn and a small, and I am bound to say, cheap and temporary horse and tool barn. All these buildings are of wood, expensive of maintenance, and necessarily short-lived.

We have no place in which good specimens of beef cattle, of sheep, or of swine can be properly sheltered or exhibited, and no place in which the more careful lines of feeding and breeding experiments can be conducted.

We have no place in which specimens from the experimental field, orchards and gardens may be safely and separately stored until full study may be given them and complete records may be taken.

The glass house is far too small for the accommodation of pot culture experiments made necessary under the demands for soil investigations now made upon the station, and the work in farm machinery has already entirely outgrown the wing of the agricultural building assigned to it, and which will shortly be needed for additional laboratories both for investigation and for instruction.

What is needed most now is a beef cattle building; not a barn but a laboratory, where the best specimens can be kept and exhibited, and where the highest order of feeding experiments may be conducted. Next in importance, if not of equal necessity, is a storage building for specimens of crops as has been indicated. Other buildings will be needed later.

These buildings are not "barns" but laboratories for special work. The need of the college and station for live stock quarters is entirely different from that of the farm, because they put them to different uses, and conversely no farmer has need of buildings of this kind any more than he would duplicate our field experiments on his farm.

Any buildings erected now for whatever purpose should be not only useful but permanent and attractive as well. The only exception to this principle is in the case of temporary structures in certain lines of investigation.

WHAT IS NEEDED IN THE WAY OF INSTRUCTION.

The number of students has doubled four times during the last four years. Not only that, the responsibilities for investigation work quadrupled in two years.

This brings heavy responsibilities and exacting work upon men. We cannot undertake new lines of instruction, nor can we take care of our present demands without additional help.

The funds of the college are entirely absorbed even though two men are off on leave. Unless additional funds are provided, a policy of contraction must be inaugurated.

Most of our instructors are young men who have been obtained at comparatively low salaries. With increasing age and experience they are growing more valuable and their recompense must be larger or we shall lose them to other states.

Our salary schedule for leading men is below that of most of the other leading states. This means that it is only a question of time until we shall lose, not our younger men, but our leading men, unless funds are available to pay them what they are worth in the markets.

Colleges cannot compete with private enterprises, but they must compete with each other, and there is no good reason why Illinois should pay less than other colleges and stations of the same class.

There is no way of avoiding this issue. The needs of the college arise from the nature of the subject and the demands of the students, and they must be squarely met or openly shirked.

WHAT OTHERS ARE DOING.

The Year Book of 1900 informs us that France, a little nation about as large as four Mississippi Valley states, maintains the following institutions devoted to agriculture:

1. Seventy-seven experiment stations of all kinds.

2. One "Agronomic Institute" with 65 instructors, many of whom are the leading authorities of France.

3. Nine "National Schools of Agriculture" with from seven to 15 teachers each.

4. Forty-three "Practical Schools," with an average of about eight teachers each.

5. Fourteen "Farm Schools" of the apprentice class.

Besides this, agriculture is taught in 3,560 primary schools and in all the normal schools. Is there any danger that we are likely to do too much by way of developing our agriculture or enabling our people to successfully compete with the French in the markets of the world?

We are not alone among the states in attempting to establish a strong college and station for the development of agriculture. Nor are we alone in asking sums that a few years ago would have seemed extravagant, but which are now respectfully considered because money devoted to the development of agriculture has been found by experience to pay.

For example, Iowa reports a herd valued at $50,000, and permanent barns valued at over $25,000. She appropriated last year $250,000 for agricultural buildings, and $35,000 for increased instruction, and the next assembly will be asked to provide additional land and an up-to-date dairy building.

Texas is asking for $405,000, for an agricultural building and with good prospect of getting it.

New York is asking for $285,000 for the college at Ithaca, in addition to the cost of maintaining its Experiment Station at Geneva, which is about $60,000.

Minnesota is asking for $280,000, and Nebraska for $100,000 for buildings, and $50,000 for equipment.

Michigan has a permanent fund of $100,000.00 annually for college purposes alone. We are asking for $50,000.00. How can Illinois compare favorably with Michigan on less than half the funds?

Does it comport with the wealth and dignity of Illinois for Michigan to put $100,000.00 a year of state funds into her college of agriculture and Illinois maintain hers on money coming from the United States government?

Missouri is asking for over $100,000.00 this year.

Ohio has over $200,000.00 invested in its experiment station at Wooster, and an equal amount in its college of agriculture at Columbus.

Wisconsin last year erected an agricultural building at $150,000.00. She had over $160,000.00 worth of agricultural buildings before and is now asking for yet larger additions, amounting to over $60,000.00.

These are large sums, but they will pay. They serve to show that Illinois is not alone in the belief that it pays to develop the agriculture of the state. Fortunately our expensive building is off our hands and we do not need to ask for the larger sums. We have no desire to be in the lead of these institutions for the sake of standing at the head--but which one of these states is superior agriculturally to Illinois, and which one lays harder duties upon its college?

THE REAL QUESTION.

The real question is, "Shall the college go ahead or stand still, which means to go backward?" "Shall Illinois maintain a first-rate or a second-rate college and station?"

THE ANSWER.

The answer to this will be found in the action upon this section of the bill.

The college cannot longer be maintained upon funds coming from the United States government, and if it is to go forward and meet the demands now made upon it the State must put money into its maintenance as other states have done and as it is doing with the station.

If the people of Illinois really want a first-rate and not a second-rate agricultural college then it must be a $50,000.00 proposition every year, aside from specific amounts devoted to investigations.

If this is provided then the college can provide and maintain suitable live stock of various kinds. It can provide additional buildings from time to time to house animals, store samples, and to conduct the more difficult lines of feeding and other experiments.

If this is done then the highest class of instructors can be obtained and retained, and not lost to other states when their worth is proved.

If this section is passed entire then the college can go forward. If it is cut out there is no alternative but to stand still, which means to go backward, for it cannot maintain its present standing on government funds. If it is reduced there is no alternative but to see other institutions clearly in the lead.

WHAT IT ALL MEANS.

Illinois built one agricultural building at $150,000, and provided $10,000 for furniture, and $6,000 a year for two years for instruction.

Illinois has made large appropriations for investigation work, and ours is now one of the very strongest stations in America.

Illinois has not asked for additional buildings since the first one.

Though olther states have expended more than twice this sum for buildings we now propose to take care of the future buildings for the purposes of agriculture, to provide needed equipment and additional instruction on $50,000 annually.

This amount is not named with a view to reduction. It is based on the most conservative estimates and is less than neighboring states are using to accomplish the same ends. What better can be expected?

WILL IT PAY?

There is no question but that money devoted to investigation pays, and pays immediately.

Will it not pay Illinois to put $50,000 a year into the education of her young men in agriculture?

Will it pay not to do it, especially when other states and nations are doing it so thoroughly?

What is asked is $50,000 annually. That is a little less than $1 for every square mile of Illinois territory. It is less than 1 cent on each six acres of land—less than a nubbin of corn to the acre of ground. Will Illinois give the nubbin for the education of young men in agriculture? I believe she will.

THE LATEST QUESTION.

The entire bill, two-thirds for investigation, and one-third for instruction, calls for less than one-half cent per acre of Illinois lands.

Would any other expenditure of public funds so many times repay the outlay? Is any other use of them so truly an investment?

The people of Illinois are upon record in this matter. It is the agricultural associations that ask the passage of this bill. In asking its passage they ask no special privileges, and they make no extravagant demands upon the treasury of the State. As one large tax payer put it, "We only ask to be allowed to put our hands into our own pockets, and take some of our own money to develop our own business." And who shall say that the farmer does not pay his full share of the taxes of the State?

All that is asked to place both this college and station on a permanent basis and a sound financial foundation is one-half a cent per acre of Illinois territory; and it is the farmers themselves who are asking it. Will they be permitted to do it?

RESULTS OF EXPERIMENT STATION WORK.

House Bill 315 of the Forty-second General Assembly provided for the extension of the work of the Experiment Station by State funds.

Each section of the bill appropriated a definite amount to be expended for the development of a distinct line of agriculture represented by an association already organized and operating in its interest. By the terms of this act the work in each case was to be undertaken along lines to be agreed upon by the director of the station and an advisory committee of five to be appointed by the association representing that interest. This gave rise to six advisory committees representing respectively (1) The Live Stock Breeders' Association; (2) The Seed Corn Breeders' Association, The Corn Growers' Association and The Grain Dealers' Association jointly; (3) The Illinois Farmers' Institute; (4) The State Horticultural Society; (5) The State Dairymen's Association, and (6) The Sugar Beet Growers' Association.

The system of advisory committees has brought thirty men, each the choice of the organization he represents, into the most intimate contact with the work of the station during the last two years.

Though serving without compensation, these men brought to their work their best judgment and experience touching the unanswered questions in their respective branches of agriculture; that they and the station labored together to lay out lines of investigation that would repay the State for the financial outlay, and to say that the relations between the committees and the station have been all along the most pleasant and mutually helpful, is but to recite the simple truth.

The authorities of the university have assumed that these organizations have asked this money for the sake of developing the State; that these committees know what are the unanswered questions of most importance to agricultural progress, and that the station employés possessed the skill to prosecute the experiments outlined.

The president and trustees, therefore, accepted the recommendations of the director based on the result of these conferences, and authorized the station to undertake the work exactly as outlined.

WHAT THE STATION HAS ACCOMPLISHED.

1. It has shown that the chemical composition of the corn kernel may be changed by selection.

2. It has increased the oil content of corn about one-third, adding five cents per bushel to its value for manufacturing purposes. This would add $2,500,000.00 to the amount annually used for glucose in this State.

3. It has increased the protein of corn one-fifth, adding three cents per bushel to its feeding value. This would add $6,000,000.00 to the feeding value of the corn crop of Illinois.

4. It has marked out a method by which farmers may select their own seed for oil or protein with approximate success.

5. It is assisting a number of breeders in accurate chemical selection of seed corn.

6. It has shown that thicker planting than is customary increases the yield but decreases the size of both ear and stalk.

7. It has shown that shallow cultivation generally gives larger yields than cultivation which is deep enough to injure the root system.

8. It has shown that middle and northern Illinois can grow sugar beets of high quality and of enormous yields.

9. It has shown that a judicious application of the right kinds of fertilizer is very profitable in the production of sugar beets.

10. It has begun the breeding of beet seed to learn whether we can grow as good or better seed from our conditions than that now imported from Europe.

11. It has pointed out some of the common causes of unsanitary dairy products.

12 It has shown that some cows have the power of making more than twice as much butter fat and milk solids from the same amount of the same kind of feed when compared with others counted good, notwithstanding it has been asserted that all animals make equal returns in amount, varying only in character.

13. It has kept a skilled man constantly in the dairy regions of northern Illinois for nearly two years conducting tests to show the differences between individual cows of the same herds and for a year at a time.

14. Through this field man it has collected a mass or information and has already been able to correct a number of mistaken practices.

15. It has conducted long and expensive digestion experiments to determine whether differences in cows are matters of digestion or of assimilation.

16. In Bulletin No. 78, is listed, described and illustrated for the first time the market classes and grades of cattle as actually handled and sold on the Chicago markets. As this is not the classification commonly reported, it represents a long and exhaustive study consuming weeks of time and much expense. The matter given is absolutely new, and by its study the farmer may know fairly well where his cattle will grade in the market.

17. It has shown that with corn as a basis for fattening, some addition of nitrogen is profitable.

18, That the addition may be in the form either of roughage or concentrate.

19. That the roughage is the cheaper form but that the concentrate (as gluten meal) puts on a quicker, if not a better finish.

20. It is conducting a joint experiment with Mr. Eugene Funk to test the value of silage for beef production.

21. It is now conducting the largest feeding experiment ever undertaken, viz., 120 animals in car load lots to test the comparative value of the six different grades of feeding cattle, from fancy selected down to the inferior; said test being to determine both comparative quality, rapidity of gains, and profit.

22. It is testing the importance of paved feeding yards as compared with unpaved.

23. It has shown that fruit may be stored in home-made warehouses cooled with ice, not only cheaper but better than by mechanical refrigeration in a distant city.

24. It has shown that fruit may be put into these warehouses in bins at picking time and sorted and barreled at leisure.

25. It has shown that for the central and northern portions of the State fruit may be stored in cellars insulated and cooled with ice, but that it is not feasible for the southern part of the State.

26. It has worked out most of the life history of that pestiferous disease, bitter rot.

27. It has shown that 96 per cent of the fruit may be saved by four thorough sprayings with Bordeaux mixture.

28. It has shown that the fungus attacks the tree as well as the fruit, and that the first infection of the fruit is likely from the tree itself.

29. It has worked out a method of freeing young and small trees from the disease.

30. It has been able to greatly extend the practice of spraying and of cultivation of orchards.

31. It has shown, preconceived opinion to the contrary notwithstanding, that the so-called hard pan lands of middle southern Illinois can be readily underdrained.

32. It has shown that underdraining has increased their yield of common crops fully 25 per cent.

33. It has studied the "principal type" of each of the ten great soil areas of the State by physical analysis of both surface and subsoils.

34. It has conducted pot culture experiments with seven out of the ten areas.

35. It has established 15 experimental fields of about ten acres each in six of the ten areas.

36. In this way it has shown that many of the cultivated soils of the State are too acid to permit the growth of root tubercles.

37. It has shown that many soils of the southern portions are so extremely acid as to leave no hope of accumulating nitrogen through the agency of bacteria.

38. It has worked out an original method of determining acidity by which it appears that the acid condition can be cheaply corrected by the addition of lime—in the form of either quick lime or of ground rock at an expense of 50 cents to $3 per acre.

39. It has shown that the white prairie soils of southern Illinois are for the most part exceedingly deficient in phosphorus, which can be cheaply corrected with ground phosphatic rock.

40. It has shown that large areas of swamp lands in Illinois are exceedingly deficient in potassium, so much so that in one case the yield of corn was increased from 15 bushels per acre to more than 40 by the application of potassium salts, costing but $1.50.

41. It has shown that the failure to grow alfalfa in Illinois hitherto is due to the fact that our soils are for the most part destitute of the bacteria that live upon the roots of this particular crop, which being a stong feeder soon exhausts the nitrogen from even the best of soils and then starves to death unless heavily manured.

42. It has shown that inoculation with soil from a field where alfalfa has been successfully grown results in a sufficient abundance of bacteria to furnish its nitrogen the first year.

43. It has been able by this means alone to accumulate as much as 300 pounds of atmospheric nitrogen per acre on the college farm in a single season (this year) which is as much as could be bought in the markets for $45 00. In this way it has been had for nothing and after giving nine tons of alfalfa hay has left more than half the whole amount behind for future crops—enough for three of the heaviest crops of corn.

THE GROWTH OF THE COLLEGE OF AGRICULTURE.

It is not too much to say that no college of agriculture has grown so rapidly as has that of Illinois in recent years. It may be said with perhaps equal truth, that no other was so long in getting about it. Eight years ago, after it

Corn Breeders and Corn Growers who attended the Corn School short course, University of Illinois.

had been established for 27 years, or almost a generation, the only property in its inventory was a half dozen picture frames and an old model of underground drainage valued at five dollars.

The facts are that the experiment of a college of agriculture had been tried, declared a failure and practically abandoned, for the property had been sold, except the remnants already mentioned, and teaching was mostly abandoned, for the only instruction given in agriculture was during the winter months, at which time the few regular students, less than a dozen, were put into the short-course classes.

For this condition of things nobody in particular was blameworthy. The people were apathetic. The time was not yet ripe for a college of agriculture in Illinois.

The University as a whole had gone through a long struggle, but the tide turned six years before, 1889, when a drill hall was provided, and the maintenance fund greatly increased. From then on the prospects brightened for the University as a whole.

But all this time, though the tide had turned for the university, the College of Agriculture was getting weaker and weaker, and so continued till 1895, when its condition was as has been described.

At this session a Library Building was provided at $150,000.00, and a Dairy Building at $40,000.00 was refused, fortunately as is now believed, and it grew darker for those who hoped to see the college resuscitated.

Four years more elapsed. It was 1899. In the meantime a heating plant had been built, and an Agricultural Building at $80,000.00 refused. Clearly the university was to live. Was the College of Agriculture to live with it?

By this time matters had improved somewhat, but very little. Two men had been added at small salaries, but they were expected to devote their time mostly to investigation; indeed we were spoken of as "the Experiment Station." The college was seldom mentioned, and was by many considered as dead.

But instruction was given throughout the year, though to less than 20 students. About the same number attended the short course, or winter school, as it was called.

In response to repeated solicitations well supported by President Draper's influence, and by dint of much pinching here and cutting there, a few animals were purchased and a small horse and tool barn erected.

But less than $5,000.00 annually was paid out for instructors; there was yet but little apparatus and no adequate room, for the Agricultural Building though twice solicited had been twice refused and this college, or what there was of it, as well as the station, except for one general office, was housed about in basements and garrets and in old rooms wherever a foothold could be found for it.

This was the condition of things, A. D. 1899, 31 years after the establishment of the College of Agriculture, four years after its practical abandonment, ten years after the tide had turned for the university as a whole, and after four years of attempted resuscitation.

By this time the university had passed its critical period ten years. Its future was now assured. It was to be a great and prosperous university. Was it to have a College of Agriculture? Relatively it looked less like it every day. If anything was to be done it must be done now and done quickly.

It was at this juncture that the Farmers' Institute took hold of the situation. It determined that the college and station should have a building for their work equal to any in existence. Everybody pulled together and it was done; and money was appropriated for an agricultural building, without a dissenting vote, this turned the tide for the College of Agriculture and from this time on progress has been rapid.

Additional instructors were employed, the work divided and more courses were offered; equipment was increased and though the short course was abolished, yet in two years, and before moving into the new building, the students had increased to 168.

PRESENT CONDITION OF THE COLLEGE OF AGRICULTURE.

There are now, only four years after entering upon the new lease of life, 28 people regularly connected with the College of Agriculture and Experiment Station. Twenty-six of these work in agriculture and two in household science. All but two devote their entire time to these lines of work and of the whole number 20 give instruction, six devote their entire time to teaching.

TWO HUNDRED EIGHTY-THREE STUDENTS.

There are now in attendance 283 students in this college. an increase of more than tenfold in four years. With one exception, this is the largest number, not short course students, registered in any college of agriculture connected with a university. It is very near the total short course registration of Wisconsin and exceeds the number of genuine agricultural students in most of the distinctively agricultural colleges, where all students must choose between two or three courses—a marked contrast to a university in which a great variety of courses are open to choice and in which only those take the agricultural course who want agriculture.

EIGHTY-EIGHT COURSES IN AGRICULTURE.

Eighty-eight separate and distinct courses of instruction are offered by this college; viz.: Eighteen in agronomy, 21 in animal husbandry, 15 in dairy husbandry, 21 in hortiticulture, nine in household science, one in breeding, and three in veterinary science.

In place of classes of one or two students, as in the old days, we now fill class rooms. There are classes of over 100 meeting today—too large for any room in the building, except Morrow hall or the stock judging room.

All the work is aimed directly at profitable farming, and the best proof of this is that our students almost invariably go to farming for themselves, and are seldom available for salaried positions. This is the most gratifying feature of it all, for though we need some men for other things it is after all the business of the college to make farmers rather than foremen or professors. Three young men have just finished an amount of work which will entitle them to graduation next June. They go immediately upon farms, although flattering offers came to "go on salary." It has been abundantly proved that Illinois boys would come to the Agricultural College when there was something to come for and not before.

The time has come when the students have so increased in numbers and demands as to exceed anything we are able to offer until such time as more funds are available for extending the equipment and increasing the instruction. Until that time the college growth must of necessity stop.

Chairman—We have come to the last number, which is a vocal solo by Miss Josephine Smith, and I wish to thank you for your very close attention this evening.

Vocal sole, Miss Josephine Smith.

Chairman—The McLean County Domestic Science Association will tender an informal reception to the State officers, delegates and lady friends who live in the vicinity, from four to five in the parlors of the Illinois Hotel tomorrow afternoon.

Chairman—You are now adjourned.

Wednesday Morning Session, 9:30 A. M.

Joseph Newman of Elgin, in chair.

Prayer—Our Father, we thank Thee for the men and women who are represented here in this institute today and in the sessions that are to be held. We thank Thee for the greater strength of our national life because of the strong men and women represented by this institute. We pray that Thou wilt abundantly bless them and today be with them.

We ask, Oh God, that Thou will bless our nation in all of its life and that from every farm, and every village and every city there may come great hosts of men and women who live and fear our God.

So bless us and keep us this day, be with us in the deliberations into the truth and help us in all our efforts. May it increase the prosperity, both spiritual and intellectual, of our beloved country. May the exercises of this day be to this end, we ask in the name of Jesus Christ. Amen.

President Coolidge—Ladies and gentlemen, it affords me a great pleasure to introduce to you Mr. Joseph Newman of the State Dairyman's Association, who will conduct the meeting this morning.

Mr. Newman—We are going to be short of time this morning, ladies and gentlemen, and we will dispense with the music and to take its place we are going to ask Mrs. Howie of Wisconsin, to give us five minutes.

Mrs. Howie—Mr. Chairman, ladies and gentlemen:

We've got a little Jersey cow
That'll weigh sev'n hundred pound
But not in the whole country is
Her equal to be found.
And so I sed to mother onc't,
As she stood breshing there
The flies from off Pet's glossy sides,
"Le's take her to the fair?"
"Pshaw! don't do foolish, Silas, dear;
Of course we think our Pet
A paragon of excellence,
But you must not forget
There's lots of folks thet's got good cows,
'n' gives 'em extra care;
And Pet's so small she'd stand no chance
To beat 'em at the fair.
Fer 'thout he's told, the jedge won't know
The pounds she gives per day,
'n' you'd look smart a braggin' up
Your own cow anyway.
"No, Silas," and she shook her head,
The matter to decide,
"Who knows but Providence might send
A jedgment on our pride?"
Fer all I saw thet mother was
In heart, somehow inclined
T' feel the same as I did, so
I jest made up my mind
To run the risk an' take our Pet
T' thet big State fair place.
'n' if she didn't get a prize, why,
'Twouldn't be no sore disgrace.
'Twould show the faith we had in her
An' no harm could be done.
She might perhaps take number three;
Worse cows than her had won.
An' then I cautioned mother: "Le's
Not raise our hopes too high
If she don't show jest what she is
With others standing by.
It's not because she lacks in worth.
But, likely, as you know.
A man may favor bigger cows
When jedging at a show."
Well, then I got an entry card
An' soon filled out the blank.

With jest as many flourishes
As tho' I owned a bank.
An' when the day at last arrived
I dressed up in my best
'n' Pet was breshed until she looked
As slick as all the rest.
An' as I led her in the ring,
Some "Smarty" thought to chaff
By calling, "Ah, there, Hayseed, that's
No place to take a calf."
Another sed: "See here, old man,
This ain't no peanut show,
You'd better wait another year
An' let your critter grow."
But I didn't mind their banter much,
Tho it cut me some I swow
T' see that mighty expert jedge
A smilin' at my cow.
I thought he might ha' spoke to her,
An' even raised his hat,
For to a twenty-five pound cow
Most breeders would do that.
But he simply glanced her over
In a sort of careless way,
Then turned to ask an Ayrshire man
About the price of hay.
Right there among the Holsteins an'
Some critters fit for beef,
With speckled cows of other breeds
To make a good relief
For solid colors, yet withal
I'd quite made up my mind
For a gen'ral purpos' bizness cow
Our Pet wa'nt far behind.
Of course 'twas my opinion 'n'
A jedge might differ some,
Leastways they mostly always do
When scorin's to be done.
But I didn't purpos' to kick none,
Ner raise a reg'lar row;
I'd take my medicine like a man
If he didn't give my cow
A single mark of honor, 'cause
Yo' know it's dreadful hard
Fer a jedge to do his level best
When owners stand on guard.
And he appeared a likely man
Thet understood his work,
Fer tho' some breeders salved him up
He wan't the one to shirk
A plain and solemn duty, when
Decisions he must make;
An' whoe'r sought to bias him
Soon found their big mistake,
Fer he wouldn't favor ne'er a one
Ner give to one a slight,
But seemed to feel in duty bound
To treat each cow jest right.
An' when he sized 'em one an' all
He took a heap of pains,
Especially when he stooped clear down
To look at their milk veins.
An' if you'd seen that feller, gee!
A measuring here and there,
You'd a thought the same as I did,
Pet wouldn't be anywhere.
An' when he'd run 'em over twict
He'd such a queerish look,
Whilst jotting down some figures, in
A little scoring book,
Thet you couldn't tell a single thing
By looking in his face;
'n somehow I became convinced
Pet wouldn't get no place.
But when at last it all was through,
Done slick as it could be,
I vum! if that perlite old chap
Didn't stop and speak to me,
An' say right out, so's all could hear,
"That a noble little thing,
She's won the blue, and here it is,"
Ef my old ears didn't ring
To hear them words! An' when I took
Thet ribbon from his hand,
Yo' ought to hear them fellers cheer—

SADIE LE PET, 77100—22 pounds 5 ounces of butter in seven days.

'Twas enough to beat the band.
An' there I stood, like a great gump,
While tears rolled from my eyes
Right down my cheeks and whiskers
To think Pet took first prize.
I coughed an' choked an' tried to speak,
But couldn't git out one word
To thank thet jedge for all he'd done;
I never even stirred.
Until some fellers laffed at me,
An' then I got my breath
In time to hear a bobby say,
"He's tickled half to death."
Then I yelled, "Were's your peanuts, boys!"
But no one said a word,
Except thet chap who hollered back,
"You bet! An' she's a bird!"
There Pet stood, calm and modest like,
A-chewing of her cud;
Such goin's on didn't seem to her
Unworthy of her blood
I whispered softly in her ear:
"You blessed little Pet!"
This proudest moment of my life
I never shall forget.
An' when we both went home nex' day,
It makes me laff right now
To think o' mother so rejoiced,
She kissed that sweepstakes cow.

Chairman—I wish to say that this poetry we have just listened to is founded on fact and was put into poetry by Mrs. Howie.

I was mistaken about the lady not being here for the music. We will have an instrumental solo by Miss Irene Seibel.

Music, instrumental, Miss Irene Seibel.

Chairman—The dairymen wish to thank the Farmers' Institute for the privilege of presenting dairying this morning. It is a subject we believe that is strong in the hearts of the people. Through the work we have been able to have done through our College of Agriculture, although not as extensive a work as we would like on account of appropriations, it has opened our eyes in the dairy portions of the State to find that Illinois, where we thought we were getting the most money out of our cows, and Mr. Glover has been there doing work, hard work, nights and Sundays, as well as week days, and we find by digging into the facts that we are mistaken. The dairymen are interested and they are willing to acknowledge their mistake.

I have been digging into the records of 1900, as presented to us from Washington, and I find that of Illinois farms 230,625 report dairying. I find of all the farmers of Illinois about 350,000 report dairying. I find 1,766,000 cows in the State and $29,638,619 the value of their product, an average of $29 a cow in the State of Illinois, and it cost $30 to keep a cow, and it is time that we are digging into it. The Legislature is giving us a larger appropriation. We were starting on the road to the poor house instead of to prosperity. We find an average of 454 gallons of milk, or say 358 pounds.

Looking to other states to see what they were doing, I found Iowa is doing a great deal of dairying, and footing it up I find she has 1,423,648 cows, but they are only getting $27,000,000 out of it—less than $20 a cow. That may be poor consolation for Illinois. We find that Minnesota who claims she is furnishing the bread and butter for the world, is less than $23 on an average; Kansas, Nebraska and

South Dakota, and we have less than $20 to a cow. I got to digging deeper and I had to turn to the eastern states to find where the money is made. I found that New York was getting $37 per cow. I went into old Vermont, she was getting $36 per cow, old New Hampshire and she was getting $55. We are growing a little too fast and we had better look back and see that there are still some good things down in Vermont.

I turned back to my own State and great was my astonishment when I found Cook county had more farms in dairying than any county in the State—4,491 farms in Cook county devoted to dairying, or at least reported dairying: Kane county, my own county, has 2,163 farms and McHenry county 2,598 farms in dairying, and I find that the product from Cook, from about 40,000 cows, amounted to one and a half million; Kane about 45,000 cows and two millions for her product, and McHenry, with about 50,000 cows, got two and a quarter million for her product.

It is nearly all dairying in Kane, Henry and DeKalb and farther west and we get what is termed the stock farm. There is something for us to study. We hope, gentlemen, when you come to the Legislature this year every dollar asked for by the Farmers' Institute will be given. It will be given if you demand it. You can have it.

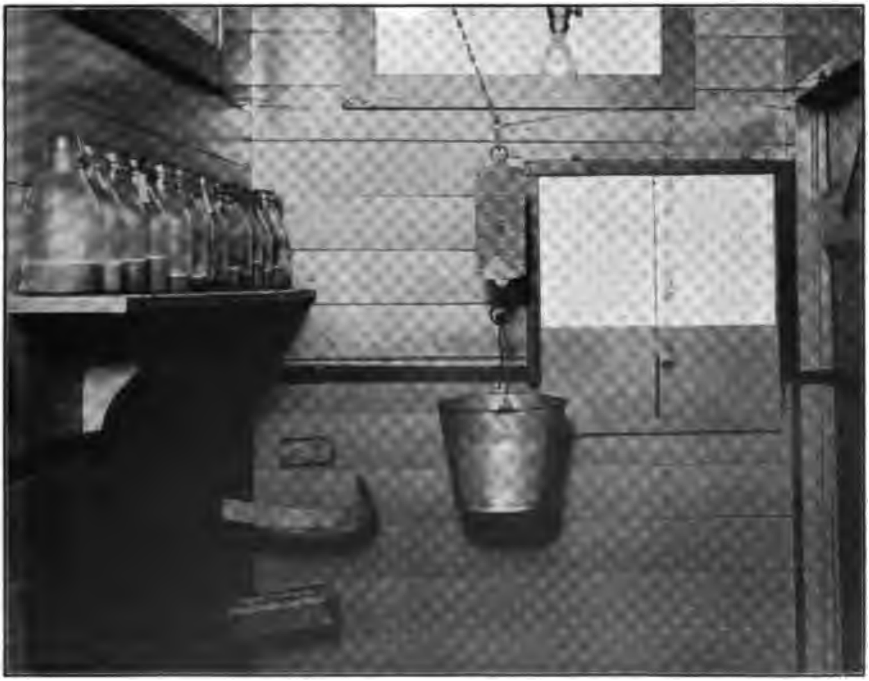
FIELD WORK IN DAIRY INVESTIGATION.

By Mr. A. J. Glover.

For over a year the department of Dairy Husbandry of the University of Illinois has been conducting field work among the dairymen of the State. A number of them were persuaded to weigh and sample each mess of milk a sufficient number of times during the year so that the performance of each cow could be estimated with a considerable degree of accuracy. It has been demonstrated by a number of our Experiment Stations that many cows are kept in the dairy at a very small profit and some at an actual loss. In order to determine the facts and to lead the dairymen to realize their full force and meaning a man was sent into the field to persuade a number of them to keep a record of every cow in their herds. While this bulletin gives no facts new to science, yet it presents a line of work on which we have but little data and it brings the farmers face to face with facts that exist upon their own farms. It shows them that some herds are kept at a good profit, some at a small profit, and others at an actual loss.

HOW THE FARM TEST WAS MADE.

The farmers who took up this work were required to weigh and sample the milk from each cow in the herd every seventh week for 14 consecutive milkings. After each cow was milked the milk was poured into a weighing pail, weighed, and the weight recorded on a milk sheet directly under the cow's name. A small sample of milk was then taken with a sample dipper or a milk thief and put into the sample bottles. Corrosive sublimate tablets were used to preserve the samples of milk. Instructions were given to each man to shake the composite samples each day so as to mix the fresh samples with the rest of the milk and keep the cream from becoming dry or hard on the sides of the bottle. The jars that were used for keeping the composite samples were one pint, tin top, covered bottles. When the period of weighing and sampling was completed the samples were tested either on the farm or at the creamery.



CUT 1—Scale for Weighing Milk. Record Sheet and Composite Samples.

APPARATUS.

The things necessary for carrying on the work were: A spring scale for weighing the milk; a small dipper or milk thief for taking the samples; bottles for holding the composite samples; corrosive sublimate for preserving them; and milk sheets. All these were furnished by the Experiment Station. Each cow was given a name or number which was placed at the top of the milk sheet so that the weights of milk could be put directly under her name or number. Cut No. 1 shows all the necessary apparatus for carrying on the work. and Table I is a sample of a farmer's milk record.

TABLE I.—SAMPLE OF FARMER'S MILK RECORD FOR ONE WEEK, FROM JULY 30, P. M., TO AUGUST 6, A. M.—MILK—POUNDS.

Number of the milking.	Spotty No. 1...	Black No. 1...	Black No. 2...	Bottle....	Milly....	Little Lamie..	Alice....	Belle.....	Sleepy Eye....	Rosney..	Pet......
1........................	20.5	14.1	11.3	15.0	15.4	10.9	6.9	7.4	7.5	5.5	15.1
2........................	13.5	6.8	6.5	10.2	13.2	8.3	5.2	3.9	5.1	3.9	10.3
3........................	22.3	16.8	11.7	15.0	17.0	11.0	6.7	7.9	7.7	5.2	15.8
4........................	14.0	5.2	8.2	10.7	14.2	8.5	5.2	4.9	4.6	3.9	10.9
5........................	20.3	15.7	6.0	13.7	16.3	10 7	6.8	6.5	7.3	4.9	15.7
6........................	16.7	7.0	9.2	11.9	15.6	9.5	5.1	5.1	6.1	4.6	12.2
7........................	18.5	15.5	4.7	14.1	16.7	9.6	7.0	6.0	6.6	5.0	14.5
8........................	16.0	7.8	7.3	11.2	14.4	8.7	5.0	4.9	6.2	3.9	14.7
9........................	22.0	14.5	13.5	16.4	18.5	10.7	6.9	7.2	6.9	5.3	15.8
10........................	14.0	9.5	6.9	10.5	15.0	8.3	4.8	4.6	5.3	3.6	11.4
11........................	19.9	9.8	4.0	12.9	17.5	11.0	6.7	6.1	7.0	5.2	14.9
12........................	14.5	13.0	6.8	11.5	14.5	8.1	4.4	4.6	5.8	3.9	11.3
13........................	22.6	13.2	6.7	16.1	18.4	11.6	8.6	7.4	7.3	7.8	16.1
14........................	15.4	7.1	8.8	11.3	14.7	8.6	4.3	5.2	5.9	4.2	11.7
Total..................	250.3	156.0	111.6	180.5	221.4	135.5	83.6	81.7	89.3	66.9	190.4
Fat, per cent..............	3.2	2.8	3.2	3.5	3.2	3.4	4.6	4.0	4.6	4.4	3.0
Fat, pounds..............	8.00	4.36	3.57	6.31	7.08	4.60	3.84	3.26	4.10	2.94	5.71

ARRANGING APPARATUS.

A considerable amount of time can be saved by arranging scales, sample bottles and milk sheet in such a way that the weighing, recording the weight, and sampling the milk can be done with as few steps and motions as possible. After the most desirable place in the barn has been chosen for weighing and sampling, the scales can be suspended from the ceiling so as to hang near the milk sheet which can be tacked to a board and hung on the wall, or fixed on an inclined shelf projecting from the wall. After the milk from each cow is weighed, a sample should be taken and placed in the jar bearing the cow's name or number. The sample bottles can be arranged on either side of the milk sheet, or if convenient, above it. If there are two or more milkers, the sample bottles can be arranged so that each milker will have his bottles together and arranged in the same order in which the cows are milked. This method saves time in finding the right sample bottle.

TIME CONSUMED IN WEIGHING AND SAMPLING.

The length of time required to weigh and sample the milk depends entirely upon the quickness of the man who is doing it. Some men will say that it takes but little time to weigh and sample each cow's milk, while others complain of the length of time necessary to do the work. It will take, on an average, about one minute to each cow, or two minutes a day. This indicates, for the seven weeks that it is done during the year, about one hour and thirty-eight minutes for each cow tested. With this amount of time expended, the farmer can have a complete record of every cow in his herd. From this, with a knowledge of what he is feeding, he will know at the end of the year whether she has been a source of profit or loss to him; and furthermore, he will know from which cows to select heifers for his dairy. Considering the time that is consumed in doing this work, it seems strange that more dairymen do not have their herds tested. Many of them can weigh and sample each cow's milk every seventh week, and then have the buttermaker test the samples for them at the creamery. With the per cent of fat and the weights of milk they can estimate for themselves the performance of every cow in their herds. The importance of doing this work will be shown further on in this bulletin.

CALCULATING THE AMOUNT OF MILK AND BUTTER FAT.

The milk was weighed and sampled during the fourth week of the seven-week periods. From the total amount of milk that each cow gave during this time, and the per cent of fat, was calculated the amount of butter fat produced in the week. From these results were estimated the amount of milk and butter fat each cow produced during the three weeks before, and the three weeks following the test. The cow's yearly record was made up from these tests, and in this way the total amount of milk and butter fat that she produced during the entire year was determined. It may be objected to that this method did not secure results absolutely correct. On this it may be said that the chief object was to secure data from which cows could be compared with each other and that this object was fully attained even though the totals may have been either slightly too large or too small. Check methods show however, that the data are very close to the actual amounts produced. In many cases the dairymen also kept an approximate account of the grain and roughage that each cow consumed during the year. Where this was done the records are of exceptionally high value, for they clearly show the profit or loss of every cow kept in the dairy.

THE DIFFERENT METHODS THAT MAY BE USED IN WEIGHING AND SAMPLING.

There are several ways that records from each cow in the dairy can be obtained. The method used in obtaining the records given in this bulletin was as follows: The farmer, every seventh week, weighed and sampled each cow's milk for 14 consecutive milkings. The amounts of milk yielded each day were added and from the per cent of butter fat which the milk contained, was determined the amount of butter fat each cow produced during the week. From these results were estimated the amount of milk and butter fat each cow produced the three weeks before and the three weeks following the test.

The dairy department of the Wisconsin Experiment Station had its patrons weigh and sample one day each week for the whole year. From the different weights and tests amount of milk and butter fat that each cow produced in the entire year was estimated.

The testing of the milk each week is too much for the average farmer to do, but taking composite samples of milk of several milkings gives a very good average of the per cent of fat contained in the milk, and can be done by any one if he chooses. Fairly accurate results can be obtained by weighing and sampling the milk every 13th week and calculating the results the same way as when the weighing and sampling were done every seventh week. The method of weighing and sampling each cow's milk every seventh week for several consecutive milkings, or three and one-half days, gives very good results. The results can be multiplied by two, which would equal the amount of milk and butter fat produced for one week, then estimated the same as if the weighing and sampling were done the entire week. The composite samples that are but three and one-half days old are in better condition for testing than samples that are a week old. The farmers will take more pains with the work if it does not become tedious to them.

The accuracy of records obtained by weighing and sampling each cow's milk at regular times during the year is often doubted. As a check a comparison was made between the amount of milk and butter fat sold from two farms to a creamery and the amount of milk and butter fat as determined from weighing and sampling each cow's milk every seventh week for 14 consecutive milkings during the year. In one case there was found a difference of 2.2 per cent of butter fat and .0015 per cent in milk, making a difference of 4.67 pounds of butter fat and 8.09 pounds of milk per cow; in the other case a difference of .038 per cent fat and 1.08 per cent in milk, or .27 pounds of butter fat and 120.3 pounds of milk per cow. From these results it is seen that by carefully weighing and sampling each cow's milk every seventh week during her period of lactation records can be secured which are substantially correct.

OBJECT OF THE WORK.

There is no better way of finding out the merits of a dairy animal when giving milk than to use the scales and the Babcock test. With the weights of milk produced, the per cent of butter fat and the length of her milking season, together with the feed consumed, the value of a cow for the dairy can be determined. The object of getting dairymen to do this work is to determine which of the individual cows in their herds are the most profitable, so that the owners may cull out the poor cows and keep the profitable ones; to show them the importance of better feeding and caring for their stock, and the importance of selecting better sires for their herds. A dairy animal should be selected for the amount of milk and butter fat which she yields during the year rather than on points of fancy or form. It is a reasonably safe rule in selecting dairy cows to go upon the results obtained from the scales and the Babcock test. If she is a good breeder, that also should be taken into consideration. If the performance of each cow in the herd is known, the heifers can be selected from the best cows, and when these heifers become fresh the test should be applied to them and the inferior ones culled out. This can only be done when we have an intelligent understanding of each cow and her capability of producing milk and butter fat.

ELEMENTS OF DANGER IN THE USE OF SCALES AND BABCOCK TEST.

While the scales and Babcock test can be of great service in the selection of our dairy animals, they must, however, be used, with judgment. Dairy cows have their "off years," and this must be considered when the herd is being culled. If we do not bear this fact in mind, we are apt to sell some of the best cows from our herds. The writer has in mind the cow Sweet Briar of the Minnesota Experiment Station, that produced for ten years an average of 358.07 pounds of butter a year, while in 1898 she produced only 206.62 pounds of butter, but in 1899 she made 306.53 pounds, and in 1901, 370.53 pounds. If the merits of Sweet Briar had been wholly based on the work she did in 1898 she would have been classed a very ordinary cow, and perhaps sold. The great value of scales and Babcock test lies in their continued use in the dairy herd and not in one year's test. Good heifers usually come from the best dairy cows, but it sometimes happens that a promising heifer may do very poorly the first year. In such cases the heifer's individuality together with her breeding should be considered before she is sold. The testing of cows should, however, be carried on in every dairy if a systematic selection is to be made.

A good cow seldom has two "off years" in succession.

THE VARIATION IN FLOW AND PER CENT OF FAT IN MILK.

It has often been asked why it is necessary to weigh and sample each milking for a week. By weighing and testing each milking separately we usually find considerable variation in milk yield and fat content. The following tables show to what extent a cow will vary in quantity of milk and per cent of fat from one milking to another. These tables are taken from records of cows that were tested for the Holstein-Friesian Advanced Registry.

TABLE 2.—SHOWING THE YIELD OF MILK AND PER CENT BUTTER FAT OF EACH MILKING FOR ONE WEEK.

Echo Bettina Herbert's Record.

		Milk, pounds.	Fat, per cent.	Fat, pounds.	Total milk, pounds.	Total fat, pounds.
1902.						
March 10	Morning	12.3	4.60	.5658	31.4	1.2411
	Noon	9.0	3.80	.3420		
	Evening	10.1	3.30	.3333		
March 11	Morning	14.2	3.10	.4402	35.2	1.0902
	Noon	10.0	3.20	.3200		
	Evening	11.0	3.00	.3300		
March 12	Morning	15.6	3.70	.5772	38.5	1.4532
	Noon	11.0	4.20	.4620		
	Evening	10.9	3.80	.4142		
March 13	Morning	17.6	3.30	.5808	41.8	1.4709
	Noon	12.2	4.05	.4941		
	Evening	12.0	3.30	.3960		
March 14	Morning	16.5	3.10	.5115	40.4	1.35485
	Noon	12.2	3.70	.4514		
	Evening	11.7	3.35	.39195		
March 15	Morning	18.0	3.50	.6300	42.9	1.6635
	Noon	12.6	4.20	.5292		
	Evening	12.3	4.10	.5043		
March 16	Morning	17.2	3.50	.6020	43.0	1.6088
	Noon	13.0	4.20	.5460		
	Evening	12.8	3.60	.4608		

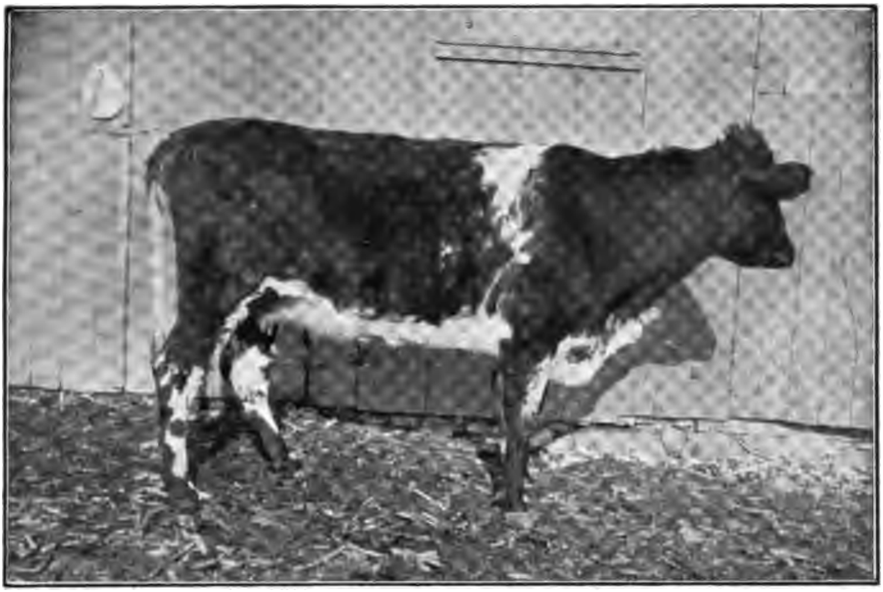
Maid Cloverdale's Record.

		Milk, pounds.	Fat, per cent.	Fat, pounds.	Total milk, pounds.	Total fat, pounds.
1902.						
Sept. 23	Morning	18.1	2.80	.506	45.3	1.322
	Noon	11.5	3.00	.345		
	Evening	15.7	3.00	.471		
Sept. 24	Morning	18.4	4.20	.772	47.0	1.580
	Noon	13.0	3.10	.403		
	Evening	15.6	2.60	.405		
Sept. 25	Morning	16.7	2.00	.334	46.5	1.250
	Noon	16.4	3.30	.541		
	Evening	13.4	2.80	.375		
Sept. 26	Morning	17.3	2.60	.449	47.2	1.544
	Noon	18.0	4.50	.810		
	Evening	11.9	2.40	.285		
Sept. 27	Morning	20.4	2.70	.550	50.1	1,396
	Noon	14.5	2.90	.420		
	Evening	15.2	2.80	.426		
Sept. 28	Morning	18.5	3.80	.703	47.5	1.442
	Noon	14.5	2.80	.406		
	Evening	14.5	2.30	.333		
Sept. 29	Morning	20.9	3.20	.668	51.1	1.488
	Noon	14.3	2.40	.343		
	Evening	15.9	3.00	.477		

The above table readily shows the importance of weighing and sampling the milk for more than one milking, if the average test of the cow is to be obtained. Maid of Cloverdale, for example, tested on the morning of Sept. 25, 2 per cent, and at noon, Sept. 26, 4.50 per cent. Had either been taken as her actual test it would have been very misleading, for her test for that particular week was 2.99 per cent.

THE BASIS UPON WHICH THE PROFIT OR LOSS OF THE COW IS COMPUTED.

It is very difficult to express the true value of the dairy cow in dollars and cents. But since the profit or loss of most of the cows tested has been given, it is perhaps well to state the basis upon which the profit or loss was calculated. The value of the product that the cow yielded was based upon the amount of butter fat that she made, and the market price of butter fat at the time.



CUT 2—Cow No. 6, Herd A, gave in one year 1,838 pounds milk; average test, 4.43 per cent; 95 pounds butter.

CUT 3—Cow No. 10, Herd A, gave in one year 3,833 pounds milk; average test, 3.37 per cent; 150 pounds butter.

OF

The value of the skim milk, the value of the calf, and the value of the manure produced by the cow were not credited to her, while on the other hand the cow was not debited with the amount of labor expended in her care nor the amount of feed she consumed when dry. The cow was simply credited with the amount of butter fat she produced, and charged for feed consumed when she was giving milk. The calf will usually pay for the cow's board when dry and the skim milk for the labor it takes to care for her. This method of calculation is, perhaps, a little unjust to some cows, for it is possible to have two cows yield the same amount of butter fat and one give a profit and the other a loss. If, for example, one milks ten months and the other but six months in the year to yield equal amounts of butter fat, which sometimes happens, one cow is charged with ten month's feed and the other with only six months.

Red Bird in herd "B" and Duchess in herd "C" are examples of this kind. Red Bird milked ten months and charged $1.28 cents for her board, and Duchess milked six months and gave a profit of $9.16, and each yielded the same amount of butter fat.

The rations for the cows were not weighed each day. A number of dishes of meal were weighed in order to get the average amount of feed that the measure held and the number of dishes that each cow received a day was recorded. Cut and shredded corn stover and ensilage were estimated in the same manner. The hay was also weighed at different times.

REPORT OF HERD "A."

Herd "A" was composed of natives, grade Shorthorns, grade Jerseys, and grade Holsteins. The average weight of each cow was 1,000 pounds. The herd was not bred for dairy purposes. Moreover, they neither showed dairy form nor capabilities of giving large flows of milk, nor producing large amounts of butter fat. Nearly every cow showed some signs of disorder. They were not in a thrifty condition. A number of them aborted during the year, while others failed to get with calf and were sold. Some of them were disposed of so early in the test that their records are not calculated with the rest of the herd.

There were ten cows kept in this herd whose milk was not weighed or tested. It is unfortunate that the owner could not see the importance of weighing and testing each one of these cows, but the average amount of milk and butter fat that each of the untested cows produced for the year will be given, for a record of the amount of milk and butter fat that was sold from all the cows was kept.

The herd did not yield the amount of milk and butter fat that it should for the amount of grain consumed. While the owner did not keep an accurate enough account of the grain and roughage each cow ate to be reported upon, he fed a ration to his cows that was largely made up of corn and other foods rich in carbohydrates and containing a small per cent of protein. The cows received a small allowance of bran with the corn meal from Oct. 1, to Jan. 1. During the months of January and February, to the cows giving the largest flows of milk, was given the following:

RATION 1.

Food stuffs.	Pounds.	Dry matter.	Protein.	Carbohydrates.	Fat.	Cost—cents.
Corn meal	10	8.91	.790	6.670	.430	10
Silage	35	7.31	.315	3.955	.245	3.5
Timothy hay	10	8.68	.280	4.34	.140	5
Total nutrients	....	24.90	1.385	14.965	.815	18.5

This ration was altogether too rich in carbohydrates and contained a very low per cent of protein. If this farmer had sold more of his corn and bought some mill feed he would, with less expense, have improved the ration. For example, a ton of corn meal would at this time have paid for more than a ton of grano-gluten. If a ration were made from five pounds of grano-gluten and three pounds of corn meal with the same amount and kind of roughage as contained in the above, the ration would be far better and cheaper. Such a ration would contain the following nutrients:

RATION 2.

Food stuffs.	Pounds.	Dry matter.	Protein.	Carbohydrates.	Fat.	Cost—cents.
Grano-gluten	5	4.71	1.335	1.94	.620	4.5
Corn meal	3	2.67	.237	2.001	.129	3
Silage	35	7.31	.315	3.955	.245	3.5
Timothy hay	10	8.68	.280	4.340	.140	5
Total nutrients	....	23.38	2.167	12,236	1.134	16

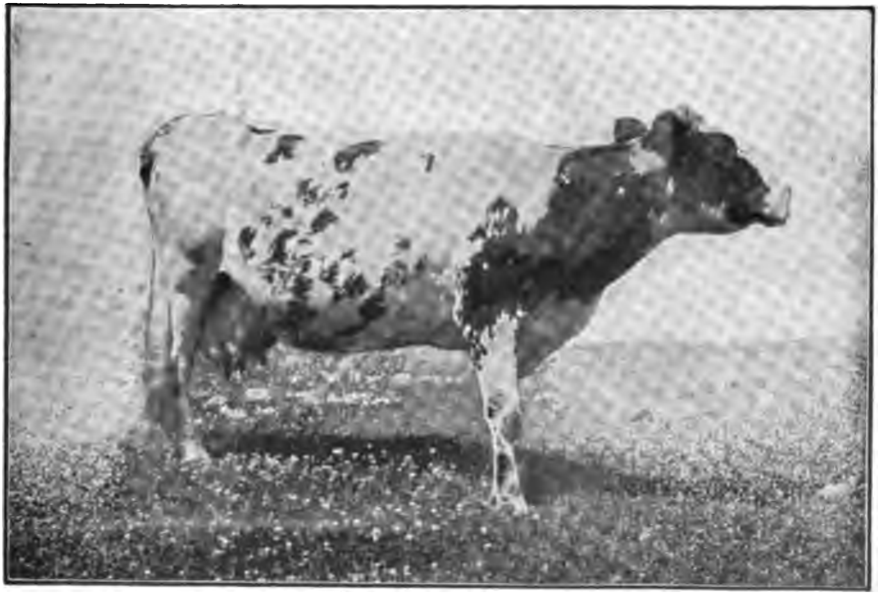
A number of the cows' udders became feverish and hard during the time that they were being fed so much corn. Four of them were giving milk from only three teats. It seems that excessive corn feeding must have had something to do with the general unsatisfactory condition of the herd, especially in the months of January and February, and perhaps the cause of four of them losing the use of one-quarter of their udders. The rye and corn meal were mixed equal parts by weight, and about eight pounds of the mixture, together with timothy hay and corn silage, was the ration they received until May 1, when ground oats was substituted in the place of rye. The cows were turned out to pasture about May 25, but were given a small allowance of silage to July 1. From this time on to the completion of the year's work they received nothing but grass. The ration which the cows received from March 1 to May 1 was somewhat better than the ration fed in January and February, but it could have been much improved with mill feed. The ration for fresh cows was about as follows:

RATION 3.

Food stuffs.	Pounds.	Dry matter.	Protein.	Carbohydrates.	Fat.	Cost—cents.
Rye	4	3.54	.396	2.704	.044	4
Crushed corn and cob meal	4	3.40	.176	2,400	.116	4
Silage	35	7.31	.315	2,955	.245	3.5
Timothy hay	7	6.08	.196	3.038	.098	3.5
Total nutrients	....	20.33	1.083	12,097	.503	15

It will be noticed that this ration which contains but 1.083 pounds of protein costs nearly as much as Ration 2, which contains 2.167 pounds of protein. It readily shows that by exchanging some of the homegrown grain for mill stuff the ration could not only have been made better but actually cheaper. It can be said that the cows in this herd did a very ordinary year's work, but considering the individuality of each animal in the herd, the general condition of their health, together with unskillful feeding, it is not at all surprising that the results are no better.

CUT 4—Cow No. 15, Herd A, gave in one year 6,145 pounds milk; average test, 3.63 per cent; 260 pounds butter; net profit, $18.40.



CUT 5—Spotty No. 1, Herd B, gave in one year 7,711 pounds milk; average test, 3.20 per cent; 288 pounds butter; net profit, $25.82.

UNIV. OF

YEARLY RECORD OF BEST AND POOREST COW IN HERD "A," AND AVERAGE FOR ENTIRE HERD.

	Milk, lb.	Fat, per cent.	Fat, lb.	Butter, lb.
Best cow, No. 15	6,145	3.63	223	260
Poorest cow, No. 37	1,452	3.97	58	68
Average record of cows tested	3,970	3.55	141	164
Average record of entire herd	3,361	3.55	119	139

It was found that the average cow must produce about 140 pounds of butter fat last year to pay for her board, since the average price for butter fat, when sold to the creameries, was 22 cents. Calculating the results upon that basis, the cows that were tested yielded a profit of 23 cents. To ascertain the amount of product yielded by each of the untested cows in the herd for the year, it was necessary to subtract the amount of milk and butter fat yielded by the 18 cows that were tested from the total amount of milk and butter fat that was sold from this dairy. In this calculation a liberal amount of milk was estimated for house use and for feeding of calves.

Total amount of milk sold from Farm "A"	97,720	lb.
Total amount of milk yielded by tested cows	76,060	"
Total amount of milk yielded by the ten untested cows	21,660	"
The average amount of milk yielded by each untested cow	2,166	"
The total amount of butter fat sold from Farm "A"	3,554	"
The total amount of butter yielded by tested cows	2,751	"
The total amount of butter yielded by ten untested cows	803	"
The average amount of butter fat yielded by each cow untested	80	"

Calculating for the whole herd, and estimating that it takes 140 pounds of butter fat to pay for a cow's board, there is a loss of $4.54 a cow, or each cow should have produced 20.64 pounds more butter fat to have paid for her keep.

The best cow in this herd gave a profit of $18.40, while the poorest was kept at an actual loss of $17.83.

TABLE 3.—RECORD OF EACH COW IN HERD "A" FOR ONE YEAR.

Group 1.—Cows Yielding Less Than 100 Lb. of Butter Fat.

No. of cow.	Age, years.	Breed.	Date of calving.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Pounds of butter.	Days in milk.
37	12	Grade Jersey	11- 8-01	1,452*	3.97	58	68	147
6	3	Native	5-29-02	1,833	4.43	81	95	210
25	8	Native	2-13-02	2,470	3.87	95	111	210

Group 2.—Cows Yielding Less Than 140 Lb. of Butter Fat.

No. of cow.	Age, years.	Breed.	Date of calving.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Pounds of butter.	Days in milk.
1	4	Grade Shorthorn	10-26-02	3,176	3.45	109	128	196
31	10	Grade Shorthorn	1-17-02	3,535	3.18	112	131	245
8	3	Native	9- 6-01	2,740	4.16	114	133	259
18	4	Native	3- 5-02	3,333	3.87	129	150	245
34	10	Grade Shorthorn, Abr	12- 5-01	4,474	2.97	133	155	294
46	3	Native	1- 8-02	3,706	3.67	136	161	259

Table 3—Continued.

Group 3.—Cows Yielding Less Than 175 Lb. of Butter Fat.

No. of cow.	Age, years.	Breed.	Date of calving.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Pounds of butter.	Days in milk.
33	10	Grade Holstein	4- 9-02	3,550	3.94	140	163	210
30	9	Native { Abr Native { Clv	9-29-02 12-18-01	4,306	3.55	153	178	259
29		Native, Abr.	3-21-02	3,916	4.00	156	182	210
4	3	Native	4-12-02	3,651	4.31	157	183	365
44	4	Native	11-16-01	5,083	3.15	160	186	294

Group 4.—Cows Yielding Less Than 225 Lb. of Butter Fat.

No. of cow.	Age, years.	Breed.	Date of calving.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Pounds of butter.	Days in milk.
12	4	Grade Holstein	3-26-02	4,895	3.87	189	221	290
2	4	Grade Holstein	10-30-01	6,824	2.80	191	223	306
16	9	Grade Holstein	1- 4-01	5,776	3.33	192	224	306
15	9	Grade P. S. H.	11- 4-01	6,145	3.63	223	260	294

* The tenth's place in the "milk" column and the tenth's and hundredth's places in the "butter fat" and "butter" columns have been eliminated for the convenience of the reader. The average "per cent fat, the average production, and the profit or loss of the herd, however, were figured before the elimination. This method not only applies to herd "A," but to all the herds tested.

THE REPORT OF HERD "B."

This herd was composed largely of common native and grade Holstein cows. There were a number of fairly good dairy cows in the herd and a number of promising heifers. The cows weighed an average, about 1,050 pounds. The general health of the herd was good. A few of the cows aborted during the year and some of them had caked udders. A few of them were sold on this account. A number of them were disposed of so early in the test that their records are not calculated with the rest of the herd, but are given separately. On the whole, it can be said that the cows received good care and were fairly well fed throughout the year.

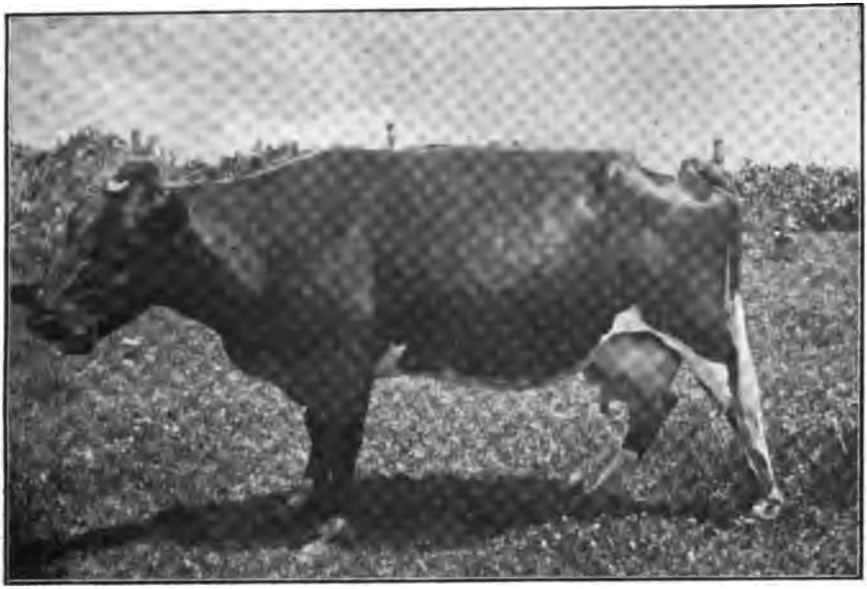
The cows were fed from Oct. 1 to Nov. 1, some ear corn and stalks and pasture. During the months of November and December the cows received the following:

RATION 4.

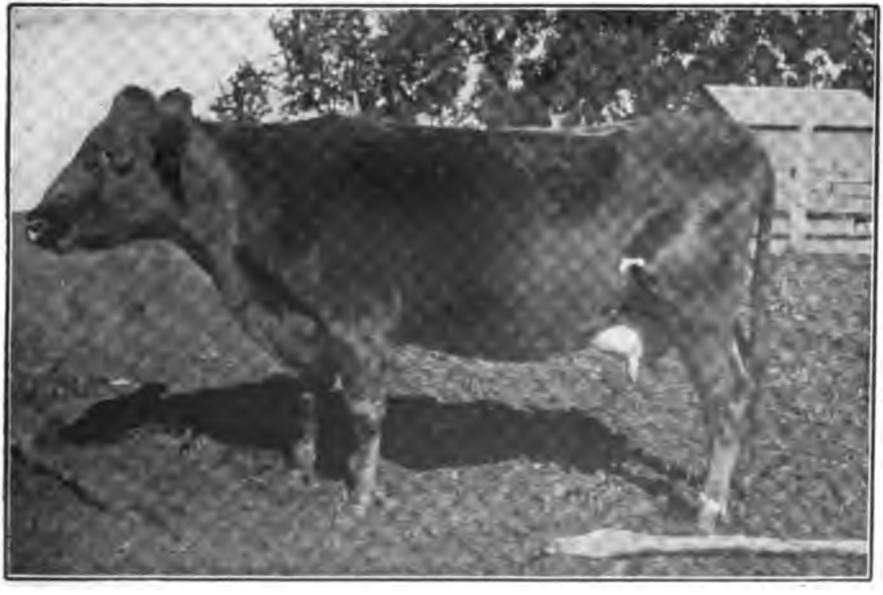
Food stuffs.	Pounds.	Dry matter.	Protein.	Carbo-hydrates.	Fat.	Cost—cents.
Bran	6	5.31	.774	2.406	.204	5.4
Corn meal	6	5.35	.474	4.002	.258	6.0
Millet hay	8	7.04	.256	3.880	.080	4.0
Corn stover	10	5.95	.170	3.240	.070	2.0
Total nutrients		23.65	1.674	13.528	.612	17.4

This ration would have been considerably better if two pounds of oil meal or gluten meal had been substituted for three pounds of corn meal, and would have cost no more.

During the months of January and February the fresh cows received seven pounds of bran, four pounds of corn meal, oat straw and corn stover *ad libitum*.



CUT 6—Red Bird, Herd B, gave in one year 4,974 pounds milk; average test, 3.04 per cent; 176 pounds butter; net loss, $1.28.



CUT 7—Crazy, Herd C, gave in one year 6,945 pounds milk; average test, 4.23 per cent; 343 pounds butter; net profit, $31.55.

In March and April they received a ration about as follows:

RATION 5.

Food stuffs.	Pounds.	Dry matter.	Protein.	Carbohydrates.	Fat.	Cost—cents.
Bran	6	5.31	.774	2.406	.204	5.4
Gluten feed	3	2.70	.699	1.521	.081	3.3
Clover hay	5	4.23	.340	1.790	.085	2.5
Corn stover	8	4.76	.136	2.592	.056	1.6
Total nutrients		17.00	1.949	8.309	.426	12.8
Oats straw *ad libitum*.						

This is a balanced ration and contains enough nutrients for cows giving large flows of milk, If some succulent food, such as roots or silage, had been added, it would have been still better.

In May, the fresh cows or the ones giving the most milk, received the following:

RATION 6.

Food stuffs.	Pounds.	Dry matter.	Protein.	Carbohydrates.	Fat.	Cost—cents.
Shorts	7	6.17	.864	3.50	.266	6.3
Gluten feed	3	2.70	.699	1.521	.081	3.3
Clover hay	5	4.23	.340	1.790	.085	2.5
Millet hay	8	7.04	.256	3.880	.080	4.0
Total nutrients	....	20.14	2.149	10.691	.512	16.1

This is another very good ration as it supplies enough nutriment for a cow producing 350 pounds of butter fat a year. Each cow in the herd during the rest of the year received two pounds of shorts a day, besides plenty of blue grass pasture.

YEARLY RECORD OF BEST AND POOREST COW IN HERD "B," AND AVERAGE FOR ENTIRE HERD.

	Milk, lb.	Fat, per cent.	Fat, lb.	Butter, lb.
Best cow, Hartwell No. 2	6,197	3.99	247	288
Poorest cow, Brindle No. 1	3,731	2.86	107	125
Average record of entire herd	5,360	3.52	188	220

Spotty No. 1 charged to produce 100 pounds of milk, 40.7 cents and 12.6 cents for one pound of butter fat.

Red Bird charged to produce 100 pounds of milk, 70.9 cents, and 23.2 cents for one pound of butter fat.

The average cost of this herd to produce 100 pounds of milk was 57.0 cents and 16.1 cents to make one pound of butter fat.

Spotty No. 1 gave a profit of $25.32 and Red Bird charged $1.28 for her board.

The average profit of each cow was $12.12.

The average price of grain and roughage from Sept. 1, 1901, to Sept. 1, 1902, was about as follows:

Bran	$18.00 per ton	Oil meal	$28.00 per ton
Shorts	18.00 per ton	Clover hay	10.00 per ton
Corn meal	20.00 per ton	Timothy hay	10.00 per ton
Corn cob meal	20.00 per ton	Millet hay	10.00 per ton
Grano-gluten	18.00 per ton	Corn stover	4.00 per ton
Gluten meal	28.00 per ton	Corn silage	2.00 per ton
Gluten feed	23.00 per ton	Pasture	$1.00 per month

The price of grain is based upon purchase price in the city market, and the price of roughage is based upon the purchase price at the farm. When the cow is charged the above prices for farm products the farmer receives a profit on his land, and the profit which the cow gives him is over and above what he could have received for his products if he had sold them upon the market, and moreover, the cows are often fed that which is not marketable. Take corn stover, for example; what would it be worth if it was not for the live stock kept upon the farms?

The average prices of butter fat, when sold to the creameries for the different months, were as follows:

September, 1901	19 cents	April, 1902	25 cents
October, 1901	19 cents	May, 1902	22 cents
November, 1901	20 cents	June, 1902	21 cents
December, 1901	22 cents	July, 1902	20.5 cents
January, 1902	24 cents	August, 1902	19 cents
February, 1902	28 cents	September, 1902	20.5 cents
March, 1902	28 cents	October, 1902	23 cents

TABLE 4—SHOWING PROFIT OR LOSS FOR EACH COW IN HERD "B" FOR ONE YEAR.

Group 1—Kept at a Loss.

Name of Cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Gross returns.	Cost of feed.	Profit or loss.
Red Bird	4,974	3.04	151	176	$23 99	$25 27	$1 28
Belle	4,412	3.38	149	174	23 26	24 30	1 04
Brindle No. 1	3,871	2.83	107	125	25 41	26 41	1 00

Group 2—Kept at a Small Profit.

Name of Cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Gross returns.	Cost of feed.	Profit or loss.
Alice	4,231	3.97	168	196	$28 61	$24 30	$4 31
Little Lamie	3,956	3.05	120	140	27 32	21 95	5 37
Harry Cow	4,891	3.14	153	179	35 00	27 93	7 07
Sleepy Eye	4,190	4.20	176	205	40 53	31 67	8 86

Group 3—Kept at a Fair Profit.

Name of Cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Gross returns.	Cost of feed.	Profit or loss.
Black No. 2	5,474	3.53	193	225	$44 28	$32 91	$11 37
Spotty No. 2	6,720	3.34	224	262	50 85	38 51	12 34
Roaney	5,706	3.94	225	262	52 43	39 46	12 97
Dora	4,889	3.76	184	215	39 51	26 40	13 11
Black No. 1	6,179	3.05	188	220	44 66	30 71	13 95

Group 4—Kept at a Good Profit.

Name of Cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Gross returns.	Cost of feed.	Profit or loss.
Hartwell No. 2	6,197	3.99	247	288	$55 47	$30 49	$24 98
Spotty No. 1	7,711	3.20	247	288	56 78	31 41	25 38

Table 4—Continued.

Group 5—Kept at a Very Fair Profit.

Name of Cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Pounds, butter.	Gross returns.	Cost of feed.	Profit or loss.
Bottle	5,450	3.66	199	232	$42 79	$27 37	$15 42
Beauty	6,402	3.82	245	286	53 62	36 79	16 83
Hartwell No. 1	4,421	4.20	186	217	38 24	21 10	17 14
Brindle No. 2	4,683	3.43	161	187	38 52	20 85	17 67
Clara	6,101	3.89	237	277	54 86	35 96	18 90
Pet	6,793	3.10	211	246	48 00	28 18	20 42

TABLE 5—RECORD OF EACH COW IN HERD "B" FOR ONE YEAR.

Group 1—Cows Yielding Less than 160 Pounds of Butter Fat.

Name of Cow.	Age yrs.	Breed.	Date of calving.	Milk pounds.	Fat per cent.	Fat pounds.	Pounds butter.	Days in milk.
Brindle No. 1	15	Native	2- 2-02	3,731	2.88	107	125	259
Little Lamie	8	..do	3- 1-02	3,956	3.05	120	140	275
Belle	3	Gr. Holst.	11-10-01	4,412	3.38	149	174	290
Red bird	6	..do	9-30-01	4,974	3.04	151	176	300
Harry Cow	10	..do	2- 3-02	4,891	3.14	153	179	240

Group 2—Cows Yielding Less than 200 Pounds of Butter Fat.

Name of Cow.	Age yrs.	Breed.	Date of calving.	Milk pounds.	Fat per cent.	Fat pounds.	Pounds butter.	Days in milk.
Brindle No. 2	4	Native	....	4,683	3.43	161	187	210
Alice	3	Gr. Holst.	11-18-01	4,231	3.97	168	196	287
Sleepy Eye	5	Native	12-25-01	4,190	4.20	176	205	220
Dora	6	Gr. Holst.	3-21-02	4,969	3.70	184	215	310
Hartwell No. 1	8	Native	5-27-02	4,421	4.20	186	217	270
Black No. 1	8	Gr. Holst.	1-28-02	6,179	3.05	188	220	275
Black No. 2	4	..do	2-21-02	5,474	3.53	193	225	240
Bottle	5	..do	4-11-02	5,450	3.66	199	232	300

Group 3—Cows Yielding Less than 250 Pounds of Butter Fat.

Name of Cow.	Age yrs.	Breed.	Date of calving.	Milk pounds.	Fat per cent.	Fat pounds.	Pounds butter.	Days in milk.
Pet	5	Gr. Holst.	2-12-02	6,793	3.10	211	246	259
Spotty No. 2	3	Native	9-24-01	6,720	3.34	224	262	300
Roaney	7	..do	11- 7-01	5,705	3.94	225	262	305
Clara	5	Gr. Holst.	10- 1-01	6,101	3.89	237	277	300
Beauty	4	Native	10- 5-01 7-31-02	6,402	3.82	245	286	308
Spotty No. 1	12	..do	2-21-02	7,711	3.20	247	288	260
Hartwell No. 2	12	..do	3- 1-02	6,197	3.99	247	288	267

REPORT OF HERD "G."

This herd was composed of natives, grade Shorthorns, grade Holsteins, one Red Poll and two grade Jerseys. The average weight of the cows was about 1,050 pounds and they were in good health during the whole year. There were no abortions or caked udders during the time the test was made. A number of the cows were sold early in the test because of their rapid falling off in milk flow when about three months along in the period of lactation. This is a very common fault with a great many cows kept in the dairy, and it is not noticed by the owners so much as it should be. They remember the cow when she gave a full pail of milk. The herd received good care during the year and was kept in a warm barn during the winter, where it received a fairly good ration. The fresh cows in October to November were fed daily about three pounds of bran, shock corn and pasture. From Nov. 15 to Jan. 1, the ration consisted of the following feeds: Bran, five pounds; corn meal, three pounds; corn stover, *ad libitum*. If the farmer could have given his cows ten pounds of alfalfa or clover hay, and less corn stover, it would have been a considerably better ration.

In January and February a little better ration was fed. It was about as follows:

Ration 7.

Food Stuffs.	Pounds.	Dry matter.	Protein.	Carbohydrates.	Fat.	Cost.
Bran	5	4.42	.645	2.005	.170	4.5c
Corn meal	5	4.45	.395	3.325	.215	5.0c
Gluten feed	1	.90	.223	.507	.027	1.1c
Timothy hay	5	4.34	.140	2.170	.070	2.5c
Corn stover	12	7.16	.204	3.888	.084	2.4c
Total nutrients	....	21.25	1.617	11.905	.566	15.5c

This ration would have been still better if the corn meal had been reduced two pounds and gluten feed increased to four pounds. During the months of March, April and May, to the cows giving the largest flow of milk were given the following:

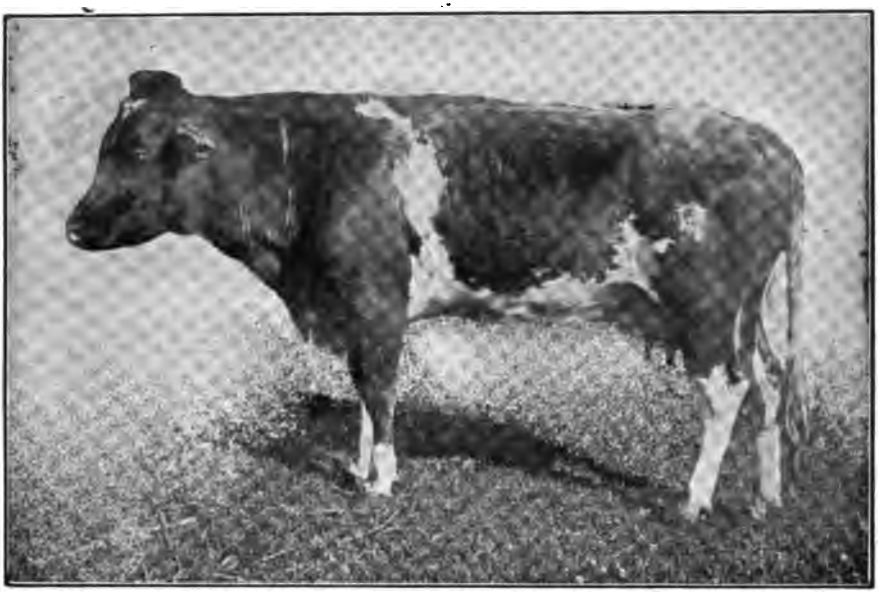
Ration 8.

Food stuffs.	Pounds.	Day matter.	Protein.	Carbohydrates.	Fat.	Cost—cents.
Bran	5	4.42	.645	2.005	.170	4.5
Gluten feed	2	1.80	.166	1.014	.054	2.2
Oil meal	1	.91	.290	.327	.078	1.4
Timothy hay	15	13.02	.420	6.510	.210	7.5
Total nutrients	....	20.15	1.524	9.856	.512	15.6

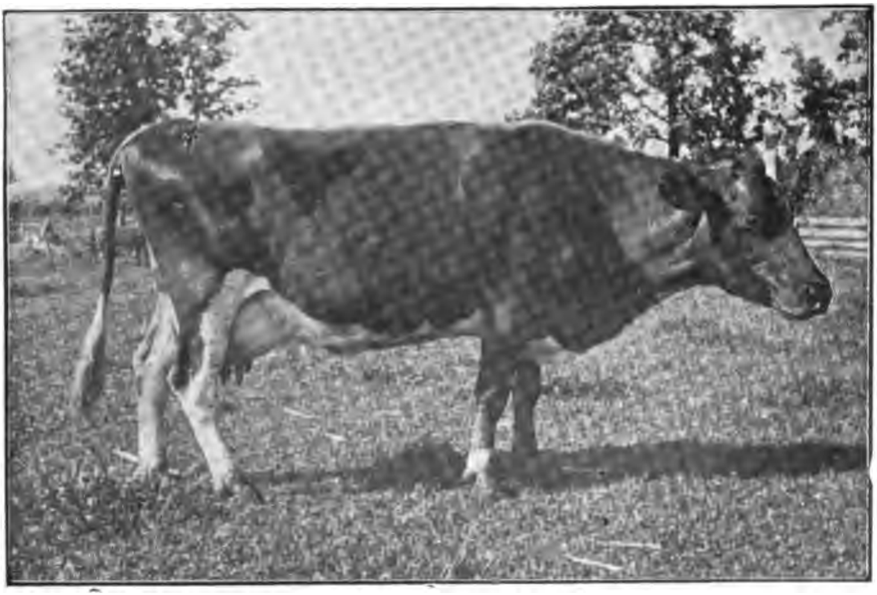
The cows were turned out to pasture about May 20, and as soon as grass was plentiful they received no grain during the rest of the test. They, however, received some forage in connection with the pasture. Green peas and oats were fed in July, and in August green sorghum. It can be said that the herd was well cared for the whole year, and moreover, every cow was fed as near as possible according to the amount of milk and butter fat that she was yielding. It must be borne in mind that the rations given above were fed to cows that were producing the most milk and butter fat and not to the strippers.

YEARLY RECORD OF BEST AND POOREST COW IN HERD "C," AND AVERAGE FOR ENTIRE HERD.

	Milk, lb.	Fat, per cent.	Fat, lb.	Butter, lb.
Best cow, Crasy	6,945	4.23	294	343
Poorest cow, Harrison	2,731	3.96	108	126
Average yield of entire herd	4,942	3.90	192	224



CUT 8—Duchess. Herd C, gave in one year 4,229 pounds milk; average test, 3,59 per cent; 177 pounds butter; net profit, $9.16.



CUT 9—Jersey. Herd C, gave in one year 5,498 pounds milk; average test, 4.48 per cent; 287 pounds butter; net profit, $24.77.

Jersey produced butter fat the cheapest. She charged 29.7 cents to produce 100 pounds of milk, and 6.6 cents to make one pound of butter fat.

Harrison charged 97.7 cents to make 100 pounds of milk, and 24.6 cents to make one pound of butter fat.

The average cost of this herd to produce 100 pounds of milk was 55.5 cents, and 14.2 cents to produce one pound of butter fat.

Jersey gave a profit of $34.77, and Harrison charged $1.27 for keeping.

The average profit for each cow in the herd was $16.22.

TABLE 6—SHOWING PROFIT OR LOSS FOR EACH COW IN HERD "C" FOR ONE YEAR.

Group 1—Kept at a Loss.

Name of cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	butter, pounds.	Gross returns.	Cost of feed.	Profit or loss.
Harrison	2,721	3.96	108	126	$27 34	$28 61	$1 27
Ella	3,519	3.64	128	149	28 12	29 98	1 86

Group 2—Kept at a Small Profit.

Name of cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	butter, pounds.	Gross returns.	Cost of feed.	Profit or loss.
White face	3,865	3.56	137	160	$31 09	$30 70	$ 39
Millie	4,118	3.88	157	184	33 68	25 29	8 39
Duchess	4,229	3.59	151	177	37 47	28 31	9 16

Group 3—Kept at a Fair Profit.

Name of cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	butter, pounds.	Gross returns.	Cost of feed.	Profit or loss.
Victoria	2,979	4.34	129	151	$26 28	$15 81	$10 47
Little Brownie	5,121	3.75	193	224	45 18	32 60	12 58
Lady	5,015	3.94	197	220	42 71	27 72	14 99

Group 4—Kept at a Very Fair Profit

Name of cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	butter, pounds.	Gross returns.	Cost of feed.	Profit or loss.
Pet	5,590	3.42	191	229	$45 15	$25 66	$19 49
Old Line Back	5,926	3.55	210	245	50 34	28 47	21 87
Queen	4,867	3.72	181	211	38 90	21 61	17 29
Black Hawk	6,600	3.90	259	302	58 52	34 88	23 64
Babe	5,186	4.68	242	283	54 78	23 60	31 18

Group 5—Kept at a Good Profit.

Name of cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	butter, pounds.	Gross returns.	Cost of feed.	Profit or loss.
Stubbornness	5,924	3.50	207	242	$45 19	$20 39	$24 80
Roaney	6,012	3.97	238	278	57 46	29 00	28 46
Crazy	6,945	4.23	294	342	66 77	35 22	31 55
Jersey	5,495	4.48	246	287	51 15	16 38	34 77

TABLE 7—RECORD OF EACH COW IN HERD "C" FOR ONE YEAR.

Group 1—Cows Yielding Less Than 160 Pounds of Butter Fat.

Name of cow.	Age, yrs.	Breed.	Date of calving.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Days in milk.
Harrison..........	2	Gr. Holst..	7- 6-01	2,721	3.96	108	126	246
Ella	2	..do	9-25-01	3,519	3.64	128	149	225
Victoria..........	4	..do	6- 5-02	2,979	4.34	129	151	214
White Face......	2	..do	9-15-01	3,865	3.56	137	160	260
Duchess..........	8	Native	1- 9-02	4,229	3.59	151	177	197

Group 2—Cows Yielding Less Than 200 Pounds of Butter Fat.

Name of cow.	Age, yrs.	Breed.	Date of calving.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Days in milk.
Millie.............	2	Gr. Holst..	10-20-01	4,118	3.83	157	184	280
Queen.............	4	Gr. S. H...	3-28-02	4,867	3.73	181	211	280
Pet	....	Gr. Holst..	11-26-01	5,590	3.43	191	223	309
Little Brownie..	8	Native	10- 3-01	5,121	3.74	192	224	345
Lady	9	Gr. S. H...	3-28-02	5,015	3.94	197	230	303

Group 3—Cows Yielding Less Than 300 Pounds of Butter Fat.

Name of cow.	Age, yrs.	Breed.	Date of calving.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Days in milk.
Stubbornness...	9	Gr. Holst.	3-29-02	5,924	3.50	207	242	346
Old Line Back..	12	Native.	12-20-02	5,926	3.55	210	245	350
Roaney...........	....	Gr. S. H.	1-5-02	6,013	3.97	238	278	345
Jersey............	9	Gr. Jer.	1-3-02	5,498	4.48	246	287	375
Babe	6	Gr. Jer.	10-3-01	5,186	4.68	242	285	365
Black Hawk	4	Gr. Holst.	9-26-01	6,500	3.99	259	306	335
Crazy.............	10	Gr. Red P.	10-4-01	6,945	4.23	294	343	335

REPORT OF HERD "D."

The cows in this herd consisted of full blood Jerseys, grade Jerseys, full blood Holsteins, grade Holsteins, natives, and grade Shorthorns. There were 60 cows in the herd when the test began and 47 of them remained through the year. Thirteen of the cows were sold during the time the test was being made for they were found to be inferior and unprofitable animals. The herd contained a great many very fine dairy cows and they made some very good records. The cows were in a good condition during the whole year and were kept in a scrupulously clean and well-ventilated barn which was scrubbed once a day and whitewashed twice a year. The sanitary condition was nearly perfect. The cows were not only well cared for, but they received well balanced rations during the entire year. The results of this herd readily show the importance of taking good care of dairy cows and of feeding them well. Some of the rations that the herd received at different times during the year show clearly how well these cows were fed.

From September 1 to the middle of October, to the cows giving the largest flow of milk, the rations consisted of six pounds of grano-gluten and all the green corn that they would eat up clean. From October 15 to December 7, the ration to the best milkers was about as follows:

RATION 9.

Food stuffs.	Pounds.	Dry matter.	Protein.	Carbohydrates.	Fat.	Cost—cents.
Grano-gluten	5	4.71	1.335	1.940	.62	4.5
Corn meal	3	2.67	.237	2.001	.129	3.0
Corn silage	45	9.40	.406	5.085	.315	4.5
Timothy hay	5	4.34	.140	2.179	.070	2.5
Total nutrients		21.12	2.117	11.196	1.134	14.5

The ration fed from Dec. 7 to Feb. 1 was as follows:

RATION 10.

Food stuffs.	Pounds.	Dry matter.	Protein.	Carbohydrates.	Fat.	Cost—cents.
Shorts	3	2.65	.366	1.50	.114	2.7
Corn meal	2	1.78	.158	1.334	.086	2.0
Gluten meal	3	2.64	.963	1.236	.075	4.2
Corn silage	45	9.40	.406	5.065	.315	4.5
Hay	5	4.34	.140	2.170	.070	2.5
Total nutrients		20.81	2.033	11.335	.660	15.9

The cows seemed to do better when fed grano-gluten and corn meal than when they were fed shorts, corn meal, and gluten meal.

The ration from February 1 to March 15 was five pounds of grano-gluten, three pounds of corn meal, and 50 pounds of silage and timothy hay. From this time on until the cows were turned out to grass, they received about the following:

RATION 11.

Food stuffs.	Pounds.	Dry matter.	Protein.	Carbohydrates.	Fat.	Cost—cents.
Grano-gluten	7	6.60	1.869	2.716	.869	6.3
Corn meal	3	2.67	.237	2.001	.129	3.0
Silage	60	12.54	.540	6.780	.420	6.0
Total nutrients		21.81	2.646	11.497	1.417	15.3

It will be noticed that this ration contains no hay, corn silage being the only roughage that the cows received. The cows did very well on this ration and when they were turned out to pasture, which was about June 1, they were in good condition. In June the cows received about four pounds of grano-gluten a day, besides a grass pasture.

In July and August they received nothing but pasture grass. The above rations apply more to the general feeding of the best milkers in the herd, the strippers and poor milkers getting according to the amount of milk they were producing.

It should be observed that the rations given to the cows during the year did not contain a large amount of grain, but each one contained a liberal amount of nutrients for cows that were giving a large flow of milk and yielding large amounts of butter fat. It will also be noticed that each ration contained over two pounds of protein. This can be accounted for when grano-gluten is compared with bran or oats, for it contains twice as much digestible protein. Therefore, it is not necessary to feed so many pounds of the grano-gluten as we would have to feed of bran or oats to get the same amount of digestible protein.

The above facts are mentioned so that the reader will not be misled when he compares the total amount of grain that each cow in this herd consumed with the total amount of grain consumed by each cow in some other herd. When the cows in this herd were not receiving grano-gluten they were receiving gluten meal which is a by product of glucose refining companies. This feed is also very rich in protein. It contains about 32 per cent of digestible protein. These facts demonstrate very clearly that it often pays farmers to sell some of their oats or corn and buy some such by-products as gluten meal, gluten feed, grano-gluten, oil meal, or dried brewer's grains, etc.

YEARLY RECORD OF BEST AND POOREST COW IN HERD "D," AND AVERAGE FOR ENTIRE HERD.

	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.
Best cow, No. 129	8,949	4.52	404	472
Poorest cow, No. 324	3,364	4.00	136	159
Average record of entire herd	5,911	4.45	263	308

Cow No. 147 made butter fat the cheapest. She charged 7.5 cents to produce one pound of butter fat and 35.5 cents to produce 100 pounds of milk.

Cow No. 44 charged the most to make butter fat. She charged 22.4 cents to make one pound of butter fat and $1.03 to make 100 pounds of milk.

The average cost to produce one pound of butter fat was 12.3 cents and 54.9 cents to produce 100 pounds of milk.

Cow No. 147 gave a profit of $57.22 and cow No. 44 charged 18 cents for her board.

The average profit of each cow in the herd was $26.64. While the average profit is very good, it would, perhaps, have been better if the owner could have personally looked after his cows. The cows were cared for entirely by hired help.

TABLE 8—SHOWING PROFIT OR LOSS FOR EACH COW IN HERD "D" FOR ONE YEAR.

Group 1—Kept at a Loss.

Name of Cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Pounds, butter.	Gross returns.	Cost of feed.	Profit or loss.
44	3,399	4.58	155	181	$34 85	$35 03	$0 18

Group 2—Kept at a Small Profit.

Name of Cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Pounds, butter.	Gross returns.	Cost of feed.	Profit or loss.
307	3,443	4.46	153	179	$35 29	$32 77	$2 52
324	3,364	4.00	136	159	33 15	29 12	4 03
305	4,617	3.83	177	206	40 17	33 30	6 87
322	4,069	4.15	169	197	40 67	33 92	6 75

Group 3—Kept at a Fair Profit.

Name of Cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Pounds, butter.	Gross returns.	Cost of feed.	Profit or loss.
22	3,197	4.86	138	161	$28 46	$19 07	$10 38
227	4,989	4.40	188	225	40 47	29 22	11 25
272	5,266	3.61	190	222	44 30	32 67	11 63
310	3,777	4.98	188	220	41 86	30 60	11 26
264	4,828	4.07	196	229	46 03	33 50	12 53
99	4,700	4.72	222	259	46 76	32 16	14 60

CUT 10–Cow No. 283, Herd D, gave in one year 10,151 pounds milk; average test, 3.68 per cent; 436 pounds butter; net profit, $45.36.

CUT 11–Cow No. 317, Herd D, gave in one year 10,069 pounds milk; average test, 3.79 per cent; 445 pounds butter; net profit, $48.94.

Table 8—Concluded.

Group 4—Kept at a Very Fair Profit.

Number of Cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Gross returns.	Cost of feed.	Profit or loss.
128	5,449	3.99	217	253	$49 41	$34 09	$15 32
40	6,575	3.23	212	248	45 83	28 74	17 09
240	5,257	4.05	213	248	50 07	32 09	17 98
325	5,446	4.30	234	273	52 73	33 94	18 79
263	4,887	4.04	197	230	41 90	22 91	18 99
336	4,796	5.00	239	279	54 11	34 88	19 23
20	4,958	4.51	223	261	51 70	32 18	19 57
13	4,462	5.26	235	274	55 03	33 88	21 15
180	5,505	4.19	230	269	50 14	28 53	21 61
326	5,285	4.79	253	295	57 64	34 07	23 57
335	5,414	4.36	236	275	56 54	32 70	23 84

Group 5—Kept at a Good Profit.

Number of Cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Gross returns.	Cost of feed.	Profit or loss.
161	5,731	4.70	269	314	$57 00	$31 65	$25 35
309	7,979	3.75	299	349	67 06	41 59	25 47
112	5,481	4.57	250	292	54 63	27 62	27 01
70	6,732	4.34	292	341	63 83	35 95	27 88
190	5,477	5.60	306	357	59 31	29 44	29 87
210	5,201	5.07	263	307	61 90	32 03	29 87
114	6,407	4.00	256	299	59 74	29 02	30 72
88	7,199	4.36	313	365	69 15	37 61	31 54
199	6,132	4.75	291	340	64 04	32 50	31 54
80	5,551	5.14	285	332	65 86	33 94	31 92
87	5,500	4.86	266	311	59 40	27 27	32 13

Group 6—Kept at a Very Good Profit.

Number of Cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Gross returns.	Cost of feed.	Profit or loss.
113	5,577	4.99	278	324	$58 01	$24 80	$33 21
108	6,286	4.46	280	327	61 19	25 23	35 96
46	6,549	4.62	302	353	71 29	35 07	36 22
247	6,581	4.76	313	365	69 10	31 68	37 42
95	7,615	4.86	369	430	79 30	36 45	42 85
248	6,811	4.79	326	380	74 30	29 27	44 98

Group 7—Kept at an Excellent Profit.

Number of Cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Gross returns.	Cost of feed.	Profit or loss.
283	10,151	3.68	374	436	$87 13	$41 77	$45 36
129	8,949	4.52	404	472	87 33	40 44	46 89
206	7,130	4.71	336	392	78 30	31 27	47 03
362	9,272	4.01	372	434	84 78	37 74	47 04
102	6,501	5.46	355	414	82 20	34 88	47 32
317	10,059	3.79	381	445	86 95	38 01	48 94
184	7,997	4.77	382	445	83 77	34 35	49 42
147	7,890	4.70	371	432	85 24	28 02	57 22

TABLE 9—RECORD OF EACH COW IN HERD "D" FOR ONE YEAR.

Group 1—Cows Producing Less Than 200 Pounds of Butter Fat.

No. of Cow.	Age, yrs.	Breed.	Date of calving.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Days in milk.
324	......	....	10-15-01	3,364	4.06	136	159	280
22	10	Native	3- 7-02	3,187	4.35	138	161	225
337	3	..do	11- 1-01	3,443	4.46	153	179	304
44	8	Gr. Jersey	3- 1-01	3,399	4.58	155	181	365
323	......	....	10-29-01	4,069	4.15	169	197	245
308	......	....	8-15-01	4,617	3.83	177	206	320
310	4	Native	7-21-02	3,777	4.99	188	220	330
272	......	....	8-11-02	4,389	3.61	190	222	350
227	7	Gr. Holst.	5-28-02	5,266	4.40	193	225	274
264	7	Native	10- 6-01	4,823	4.07	196	229	303
263	7	Gr. Holst.	4-13-02	4,887	4.04	197	230	218

Group 2—Cows Producing Less Than 225 Pounds of Butter Fat.

No. of Cow.	Age, yrs.	Breed.	Date of calving.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Days in milk.
40	9	Native	3-23-02	6,575	3.23	212	248	274
240	5	Gr. Holst.	12- 1-01	5,257	4.06	213	248	336
128	6	Gr. S. H ..	8-24-01	5,449	3.99	217	253	275
99	7	Native	5- 1-02	4,700	4.72	222	259	304
30	5	Gr. S. H ..	11-15-01	4,958	4.51	223	261	270

Group 3—Cows Producing Less Than 275 Pounds of Butter Fat.

No. of Cow.	Age, yrs.	Breed.	Date of calving.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Days in milk.
180	......	....	3-16-02	5,506	4.19	230	269	267
325	5	Native	4-13-02	5,446	4.30	234	273	300
13	9	Jersey	12- 1-01	4,462	5.26	235	274	332
235	8	Native	10-27-02	5,414	4.36	236	275	365
336	......	....	11- 1-01	4,796	5.00	239	279	349
112	10	Gr. Jersey	3-23-02	5,481	4.57	250	292	362
326	7	Native	10- 6-01	5,285	4.79	253	296	325
114	10	..do	1- 5-02	6,407	4.00	256	299	275
210	10	..do	12- 8-01	5,201	5.07	263	307	306
87	9	..do	2-23-02	5,500	4.85	266	311	353
161	7	Gr. Jersey	4-13-02	5,731	4.70	269	314	300

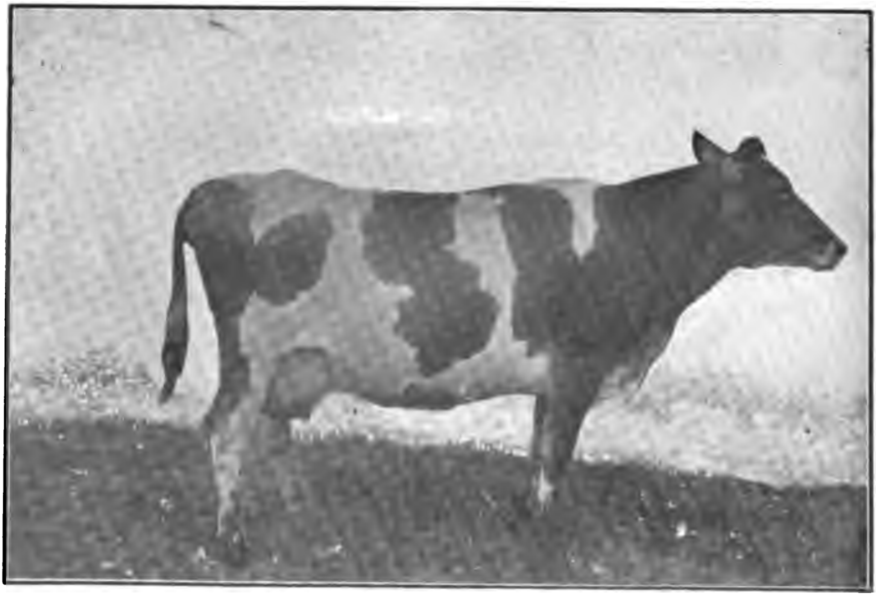
Group 4.—Cows Producing Less Than 325 Pounds of Butter Fat.

No. of Cow.	Age, yrs.	Breed.	Date of calving.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Days in milk.
113	9	Native	3-23-02	5,577	4.99	278	324	295
109	9	..do	3-23-02	6,286	4.46	280	327	269
80	......	....	11-24-01	5,551	5.14	285	332	300
199	8	Gr. Jersey	3-13-02	6,132	4.75	291	340	300
70	11	Native	6- 3-02	6,732	4.34	292	341	330
309	......	....	7-21-01	7,979	3.75	299	349	305
46	11	Native	11- 3-01	6,549	4.62	302	353	302
190	11	Gr. Jersey	6-20-01	5,477	5.59	306	357	306
247	10	Native	3-25-02	6,581	4.76	313	366	274
33	10	Gr. Jersey	8- 4-02	7,190	4.36	313	366	295

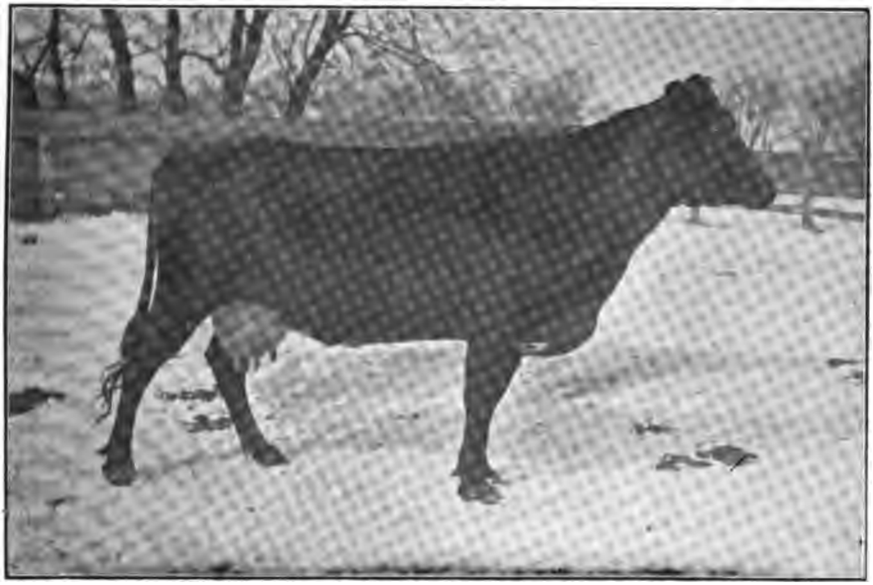
Group 5.—Cows Producing Less Than 405 Pounds of Butter Fat.

No. of Cow.	Age, yrs.	Breed.	Date of calving.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Days in milk.
249	5	Native	1-19-02	6,811	4.79	326	380	211
206	9	..do	10-20-01	7,130	4.71	336	392	250
102	7	Gr. Jersey	11-17-01	6,501	5.46	355	414	300
95	6	Native	6-12-01	7,615	4.85	369	430	300
147	8	..do	12- 1-01	7,890	4.70	371	432	275
262	8	..do	10- 6-01	9,272	4.01	372	434	330
236	8	Gr. Holst.	12- 1-01	10,151	3.68	374	436	316
317	5	Holstein..	9-23-01	10,059	3.79	381	445	365
184	10	Gr. Jersey	3- 9-02	7,997	4.77	382	445	330
129	10	Gr. Holst.	11-15-02	8,949	4.52	404	472	325

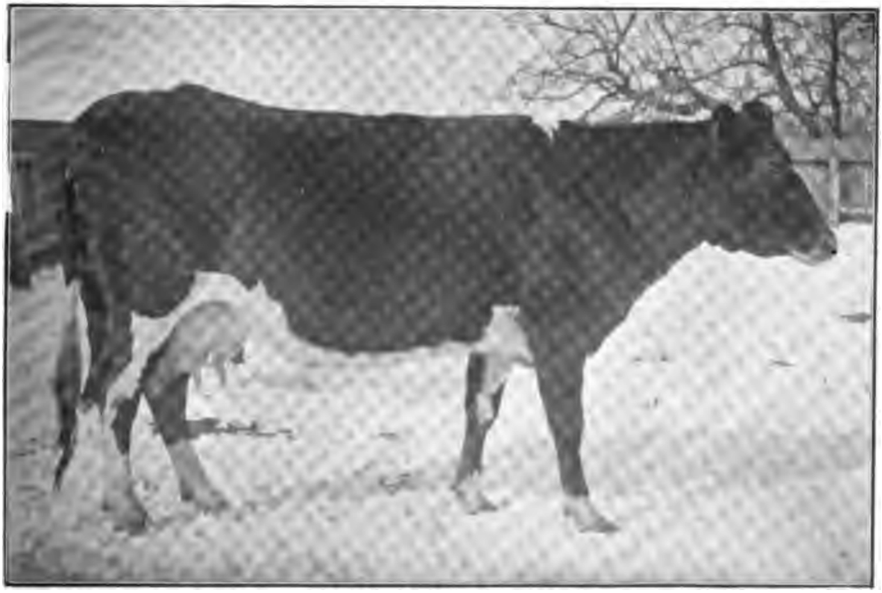
CUT 12—Cow No. 147, Herd D, gave in one year 7,890 pounds milk; average test, 4.70 per cent; 432 pounds butter; net profit, $57.22.



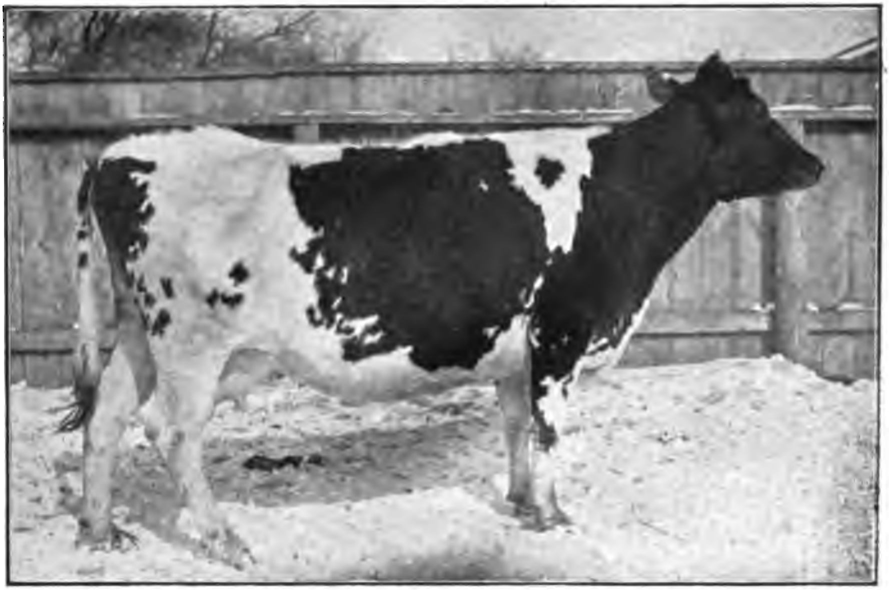
CUT 13—Cow No. 199, Herd D, gave in one year 6,132 pounds milk; average test, 4.75 per cent; 340 pounds butter; net profit, $31.54.



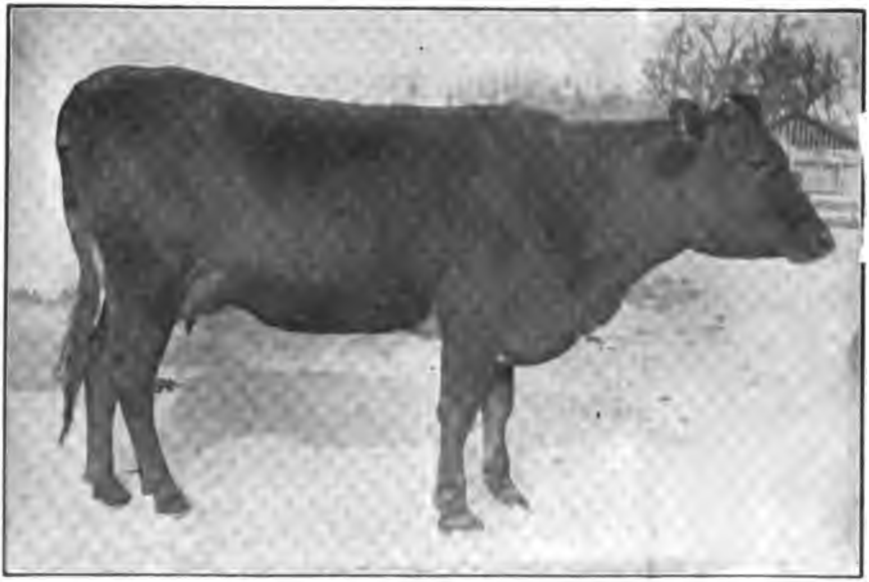
CUT 14—Cow No. 44, Herd D. gave in one year 3,899 pounds milk; average test, 4.58 per cent; 181 pounds butter; net loss, 18 cents.



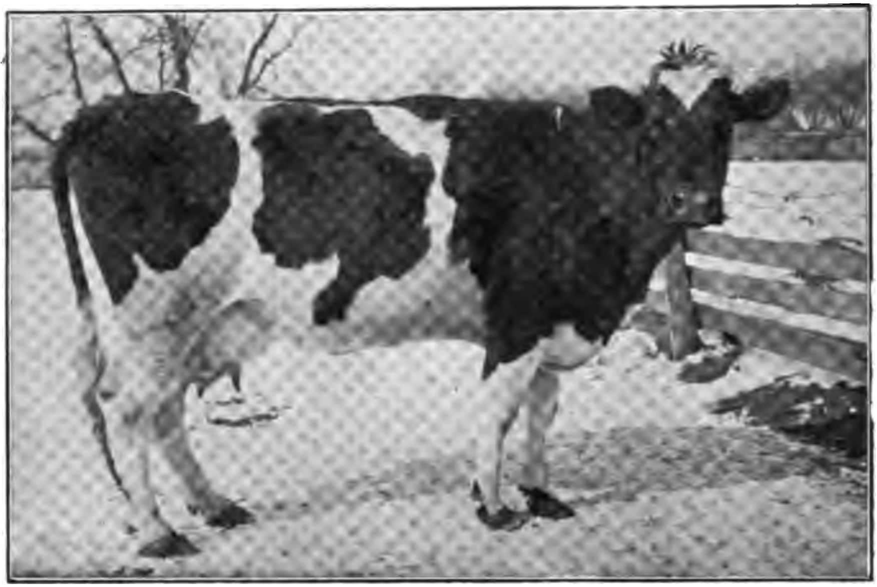
CUT 15—Cow No. 184, Herd D. with two quarters of her udder gone, gave in one year 7,997 pounds milk; average test, 4.77; 445 pounds butter; net profit, $49.42.



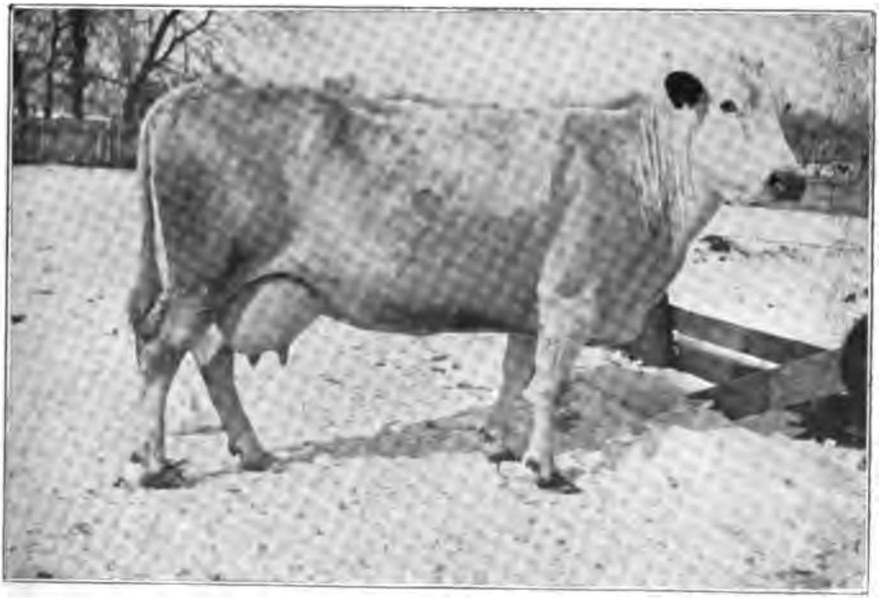
CUT 16—Cow No. 95, Herd D, gave in one year 7,615 pounds milk; average test, 4.85 per cent; 430 pounds butter: net profit, $43.86.



CUT 17—Cow No. 337, Herd D, gave in one year 3,443 pounds milk; average test, 4.46 per cent; 179 pounds butter; net profit, $2.52.



CUT 18—Cow No 263, Herd D, gave in one year 4,887 pounds milk; average test, 4.04 per cent; 230 pounds butter; net profit, $18.99.



CUT 19—Cow No. 40, Herd D, gave in one year 6,575 pounds milk; average test, 3.23 per cent; 248 pounds butter; net profit, $17.09.

UNIV. OF

REPORT OF HERD "E."

This was a small dairy of seven cows, but each one proved herself to be a profitable animal. The herd consisted of grade Ayrshires, natives, and one grade Jersey; the average weight was 950 pounds. The cows were well fed and cared for during the test, and at the end of the year they were in good healthy condition. No caked udders, abortions, or other mishaps came to this herd during the year and no cows were sold, for every one in the herd gave the owner a good profit. Nearly all the cows came fresh the last of September and the first of October, and went dry in August. It was a winter dairy.

In October and November the cows received five pounds of bran, five pounds of corn meal, corn stover, and some pasture.

In December and to January 15 they received the following:

RATION 12.

Food stuffs.	Pounds.	Dry matter.	Protein.	Carbohydrates.	Fat.	Cost. cents.
Carbon-gluten	2.5	2.35	.667	.970	.305	2.2
Bran	6.0	5.31	.774	2.406	.204	5.4
Corn and cob meal	4.0	3.40	.176	2.400	.116	4.0
Millet	5.0	4.40	.160	2.425	.050	2.5
Stover	10.0	5.95	.170	3.240	.070	2.0
Total nutrients	....	21.41	1.947	11.441	.745	16.1

This is not only a balanced ration but it contains a variety of food stuffs and is palatable. Palatability should always be considered in making up a ration for a dairy cow.

From Jan. 15 to March 1 the cows received the following ration: Six pounds of bran, three pounds of grano-gluten, five pounds of timothy hay, and all the corn stover they would eat up clean.

In March and to April the 10th, they received 2.5 pounds of bran, 2.5 pounds of grano-gluten, five pounds timothy hay, and corn stover *ad libitum*.

The first part of April the cows were turned out to rye pasture, and about the 15th of May were turned to blue-grass pasture. The herd was given no grain from April 10 to the completion of the year's work. It might be said that the rye pasture was plowed up and planted to corn—in other words, this farmer had a good pasture for a month by simply sowing his intended corn ground to rye in the fall. The cows liked the rye pasture so well that they cared nothing for grain when they were grazing in this field.

YEARLY RECORD OF BEST AND POOREST COW IN HERD "E," AND AVERAGE FOR ENTIRE HERD.

	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.
Best cow, Brindle	7,826	4.41	345	408
Poorest cow, Star	5,296	3.99	210	245
Average record of entire herd	6,478	4.19	271	317

Brindle charged 39.1 cents to make 100 pounds of milk, and 8.8 cents to make one pound of butter fat.

Star charged 54.4 cents to make 100 pounds of milk, and 13.9 cents to make one pound of butter fat.

TABLE 12.—SHOWING PROFIT FOR EACH COW IN HERD "F" FOR ONE YEAR.

Group 1.—Kept at a Profit.

Name of Cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Gross returns.	Cost of feed.	Net profit.
Mittie	3,461.8	3.19	110.54	128.96	$24 33	$21 58	$ 2 75
Lady	4,396.4	3.39	149.05	173.89	34 41	22 66	11 75
Joe's Bride	5,136.7	3.00	154.22	180.04	32 31	20 47	11 84
Loma	5,677.1	3.14	178.44	208.18	40 96	27 85	13 11
Bell	5,050.2	3.61	182.56	212.98	38 89	23 94	14 95
Maid	5,979.1	3.34	200.12	233.47	44 22	26 27	17 95

Group 2.—Kept at a Fair Profit.

Name of Cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Gross returns.	Cost of feed.	Net profit.
Mutual	5,586.5	3.25	181.82	212.12	$41 07	$22 11	$18 96
Check	6,812.6	3.16	215.79	251.75	50 22	30 92	19 30
Maud	5,426.9	3.39	184.36	215.08	42 54	22 66	19 88
Zipsy	6,219.2	3.53	219.73	256.35	49 03	26 57	22 46
Echo	6,039.6	3.66	221.16	258.02	50 03	27 52	22 51

Group 3.—Kept at a Good Profit.

Name of Cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Gross returns.	Cost of feed.	Net profit.
Zur	6,610.0	3.29	218.01	254.34	$49 58	$25 55	$24 03
Alfrida	7,641.5	3.22	246.10	287.11	55 55	27 52	28 03
Princess	7,817.4	3.35	262.28	305.99	58 88	26 25	32 63

TABLE 13—RECORD OF EACH COW IN HERD "F", FOR ONE YEAR.

Group 1—Cows Yielding Less than 180 Pounds of Butter Fat.

Name of cow.	Age, year.	Breed.	Date of calving.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Days in milk.
Mittie	3	Holstein..	7-12-02	3,461	3.19	110	128	269
Lady	4	.. do	12-1-01	4,396	3.39	149	173	300
Joe's Bride	9	.. do	4-5-02	5,136	3.00	154	180	275
Loma	12	.. do	2-13-02	5,677	3.14	178	208	285

Group 2—Cows Yielding Less than 205 Pounds of Butter Fat.

Name of cow.	Age, year.	Breed.	Date of calving.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Days in milk.
Mutual	2	Holstein..	11-18-01	5,586	3.25	181	212	315
Belle	3	.. do	5-28-02	5,050	3.61	182	212	292
Maud	3	.. do	12-1-01	5,426	3.39	184	215	300
Maid	3	.. do	10-9-01	5,979	3.34	200	233	280

Group 3—Cows Yielding Less than 275 Pounds of Butter Fat.

Name of cow.	Age, year.	Breed.	Date of calving.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Days in milk.
Check	15	Holstein..	1-23-02	6,812	3.16	215	251	252
Zur	3	.. do	1-31-01	6,610	3.29	218	254	365
Zipsy	3	.. do	10-13-01	6,219	3.53	219	256	365
Echo	4	.. do	10-11-01	6,039	3.66	221	258	304
Alfrida	7	.. do	10-14-01	7,641	3.22	246	287	330
Princess	4	.. do	8-26-01	7,817	3.35	262	306	300

TABLE 12.—SHOWING PROFIT FOR EACH COW IN HERD "F" FOR ONE YEAR.

Group 1.—Kept at a Profit.

Name of Cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Gross returns.	Cost of feed.	Net profit.
Mittie	3,461.8	3.19	110.54	128.96	$24 33	$21 58	$ 2 75
Lady	4,386.4	3.39	149.06	173.89	34 41	22 66	11 75
Joe's Bride	5,136.7	3.00	154.22	180.04	32 31	20 47	11 84
Loma	5,677.1	3.14	178.44	208.18	40 96	27 85	13 11
Bell	5,050.2	3.61	182.56	212.98	38 89	23 94	14 95
Maid	5,979.1	3.34	200.12	233.47	44 22	26 27	17 95

Group 2.—Kept at a Fair Profit.

Name of Cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Gross returns.	Cost of feed.	Net profit.
Mutual	5,586.5	3.25	181.82	212.12	$41 07	$22 11	$18 96
Check	6,812.6	3.16	215.79	251.75	50 23	30 93	19 30
Maud	5,426.9	3.39	184.36	215.08	42 54	22 66	19 88
Zipsy	6,219.2	3.53	219.73	256.35	49 03	26 57	22 46
Echo	6,039.6	3.66	221.16	258.03	50 03	27 52	22 51

Group 3.—Kept at a Good Profit.

Name of Cow.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Gross returns.	Cost of feed.	Net profit.
Zur	6,610.0	3.29	218.01	254.34	$49 58	$25 55	$24 03
Alfrida	7,641.5	3.22	246.10	287.11	55 55	27 52	28 03
Princess	7,817.4	3.35	262.23	305.99	58 88	26 25	32 63

TABLE 13—RECORD OF EACH COW IN HERD "F', FOR ONE YEAR.

Group 1—Cows Yielding Less than 180 Pounds of Butter Fat.

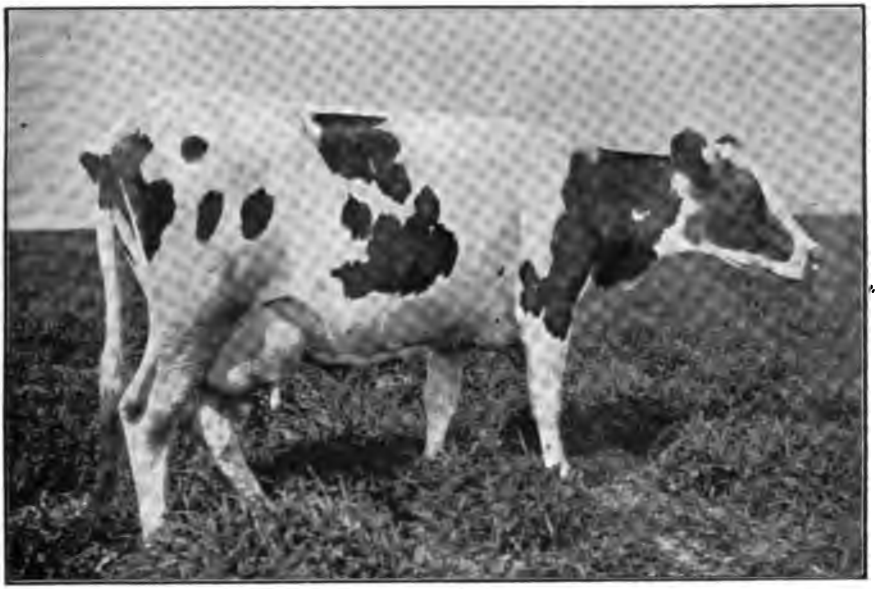
Name of cow.	Age. year.	Breed.	Date of calving.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Days in milk.
Mittie	3	Holstein	7-12-02	3,461	3.19	110	128	280
Lady	4	.. do	12-1-01	4,386	3.39	149	173	300
Joe's Bride	9	.. do	4-5-02	5,136	3.00	154	180	275
Loma	12	.. do	2-12-02	5,677	3.14	178	208	285

Group 2—Cows Yielding Less than 205 Pounds of Butter Fat.

Name of cow.	Age. year.	Breed.	Date of calving.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Days in milk.
Mutual	2	Holstein	11-18-01	5,586	3.25	181	212	315
Belle	3	.. do	5-28-02	5,050	3.61	182	212	302
Maud	3	.. do	12-1-01	5,426	3.39	184	215	280
Maid	3	.. do	10-9-01	5,979	3.34	200	233	300

Group 3—Cows Yielding Less than 275 Pounds of Butter Fat.

Name of cow.	Age. year.	Breed.	Date of calving.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Days in milk.
Check	15	Holstein	1-23-02	6,812	3.16	215	251	363
Zur	2	.. do	1-31-01	6,610	3.29	218	254	365
Zipsy	3	.. do	10-13-01	6,319	3.53	219	256	325
Echo	4	.. do	10-11-01	6,039	3.66	221	258	334
Alfrida	7	.. do	10-14-01	7,641	3.22	246	287	330
Princess	4	.. do	8-26-01	7,817	3.35	262	305	290



CUT 22—Check, Herd F, gave in one year 6,812 pounds milk; average test, 3.16 per cent; 251 pounds butter; net profit, $19.30.

CUT 23—Maid, Herd F, gave in one year 5,979 pounds milk; average test, 3.24 per cent; 228 pounds butter; net profit, $17.95.

REPORT OF HERD "G."

There were only five cows in this herd at the beginning of the test and two of them were sold three months after the work began. The strange thing about the selling of these animals was that they were good cows, for they had averaged 7½ pounds of butter fat a week up to the time that they were disposed of. The herd was not well fed or cared for, but did a very fair year's work, notwithstanding. The cows were not kept in a comfortable barn, or one that was well cleaned. The dairy with this man was, so to speak, a sort of necessary evil.

The amount of grain and roughage that each cow consumed during the year was not kept, so there is no feed account reported.

TABLE 14—RECORD OF EACH COW IN HERD "G" FOR ONE YEAR.

Name of cow.	Breed.	Milk, pounds.	Fat, per cent.	Fat. pounds.	Butter, pounds.	Days in milk.
Jersey	Gr. Jersey	3,644	3.96	144	168	275
Mollie	Native	3,930	3.94	155	180	210
Lucy	Native	7,021	3.94	277	323	280

RECORD OF HERD "H."

This herd consisted of eight native cows whose average weight was about 1,000 pounds. The cows were very ordinary animals and they did a very ordinary year's work. The most of them calved in March, and were dry by the first of November, the owner not trying to make milk in winter. The barn in which these cows were kept was very poor, being cold and poorly cared for. The stock was often exposed to cold, rain and snowstorms, and the frozen snow and ice was often removed with brooms from the animals' backs.

In March and April the cows received a small amount of bran and corn meal and about one pound of oil meal a day, with clover hay and corn stover. By May 15 the cows were turned into a pasture which was not very good, the greater portion of it being woods. They received in connection with pasturage about two pounds of bran a day, but this was not enough grain when the kind of pasture is considered. The later part of July the cows were changed to a good clover pasture.

TABLE 15—SHOWING RECORD OF TWO COWS EVERY SEVENTH WEEK DURING THEIR PERIOD OF LACTATION.

Fanny.

Week Ending	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.
March 31	193.4	3.2	6.16	7.18
May 19	142.4	4.3	6.12	7.14
July 7	84.3	4.0	3.37	3.93
August 25	7.0	6.9	.48	.56

Lily.

Week Ending	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.
May 19	171	3.9	6.67	7.78
July 17	99	3.5	3.47	4.04
August 25	123.9	3.6	4.46	5.20
October 27	75.2	4.1	3.08	3.59

These tables are good examples of the milk and butter fat yield of all the cows at different times during the test. They clearly show that the cows were not persistent milkers. The individuality of the cows, the poor care, and the poor feeding which they received, undoubtedly caused the rapid decline in milk and butter fat production from one period to the next and their short period of lactation.

The cows gave more milk and butter fat in the August test than they did in July. This was probably due to the fact that the cows were taken from a poor wood pasture the last of July and put into a good clover pasture.

YEARLY RECORD OF BEST AND POOREST COW IN HERD "H," AND AVERAGE FOR ENTIRE HERD.

	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.
Best cow, Jessie	5,420	4.08	221	258
Poorest cow, Fanny	2,398	3.92	94	109
Average record of entire herd	3,852	4.02	155	180

TABLE 16—RECORD OF EACH COW IN HERD "H" FOR ONE YEAR.

Name of Cow.	Age, yrs.	Breed.	Date of calving.	Milk, pounds.	Fat, per cent.	Fat, pounds.	Butter, pounds.	Days in milk.
Fanny	......	Native	3-20-02	2,398	3.92	94	109	196
Lucy	2	..do	3-31-02	2,843	4.31	122	142	230
Bess	4	..do	2-20-02	3,896	3.70	144	168	240
Lily	3	..do	3-25-02	3,937	3.80	149	174	225
Liza	5	..do	3-13-02	3,980	4.07	162	189	230
Reddie	6	..do	1-21-02	3,848	4.23	163	190	285
Belle	7	..do	3-23-02	4,498	4.07	183	213	215
Jessie	5	..do	3-22-02	5,420	4.08	221	258	216

It is perhaps well to compare the performance of eight of the poorest cows as well as eight of the best cows kept in different herds, and also compare the average production and profit of each herd tested. This is done to show the great differences, even among the poorest and best cows, and also the difference in production and profits between herds of cows kept upon the farms of Illinois.

TABLE 17—COMPARING THE PERFORMANCE OF THE POOREST COWS KEPT IN DIFFERENT HERDS.

Cow.	Herd.	Milk, pounds.	Fat, per cent.	Butter, pounds.	Net profit or loss.	Cost of 100 pounds of milk.	Cost of 1 pound of of fat, cents.
No. 37	"A"	1,452	3.97	68	$—*17 83	$2 07	52.2
Harrison	"C"	2,721	3.96	126	—1 27	97	24.6
Red Bird	"B"	4.974	3.04	176	—1 28	70	23.2
No. 44	"D"	3,399	4.58	181	— 18	1 03	22.4
Mittie	"F"	3,461	3.19	128	2 75	63	19.5
Star	"E"	5,398	3.89	245	20 54	54	13.9
Jersey	"G"	3,644	3.96	163	....	....	....
Fanny	"H"	2,398	3.92	109	....	....	....

* This is estimated on the basis that it took 140 pounds of butter fat to pay for feed.

TABLE 18—COMPARING THE PERFORMANCE OF THE BEST COWS KEPT IN DIFFERENT HERDS.

Cow.	Herd.	Milk—pounds.	Fat—per cent.	Pounds of butter.	Net profit.	Cost of 100 pounds of milk—cents.	Cost of 1 pound of fat—cents.
Jersey	"C"	5,498	4.48	287	$34 77	29.7	6.6
No. 147	"D"	7,890	4.70	432	57 22	35.5	7.5
Brindle	"E"	7,828	4.41	403	49 97	39.1	8.8
Princess	"F"	7.817	3.35	305	32 68	33.5	10.0
Spotty No. 1	"B"	7,711	3.29	288	25 32	40.7	12.6
No. 15	"A"	6,145	3.63	260	*18 40	50.1	13.7
Lucy	"G"	7,021	3.94	323	....	....	....
Jessie	"H"	5,420	4.08	258	....	....	....

* This is estimated on the basis that it took 140 pounds of butter to pay for feed.

TABLE 19—COMPARING THE AVERAGE PERFORMANCE OF ALL THE COWS IN EACH OF THE HERDS TESTED.

Herd.	Milk—pounds.	Fat—per cent.	Pounds of butter.	Net profit or loss.	Cost of 100 pounds of milk—cents.	Cost of 1 pound of fat—cents.
"A"	3,361	3.55	139	$—4 54	92.5	25.8
"B"	5,360	3.52	220	12 12	57.0	16.1
"C"	4,942	3.90	224	16 22	55.5	14.2
"F"	5,846	3.32	227	18 58	42.9	12.9
"D"	5,911	4.45	306	26 64	54.9	12.3
"E"	6,474	4.19	317	35 89	42.8	10.4
"G"	4,865	3.95	224	....	....	....
"H"	3,852	4.02	180	....	....	....

TABLE 20—COMPARING THE RESULTS FROM THE SIX MOST PROFITABLE COWS IN HERD "D" WITH THE RESULTS FROM FIVE OTHER HERDS.

Herd.	Number of cows in herd.	Pounds of milk.	Pounds of butter.	Total profit.	Total loss.
"D"	6	50,669	2,644	$296 97	....
"A"	28	94,126	3,899	....	$127 12
"B"	20	107,217	4,409	242 41	....
"C"	17	84,014	3,823	275 90	....
"E"	7	45,322	1,220	250 63	....
"F"	14	81,845	3,178	260 15	....

This table simply shows that a few good cows will yield a greater profit than large herds of unselected animals. It was found in herd "D," that 15 of the best cows gave a profit of $651.94 while the other 32 cows gave a profit of only $600.24, or, the 15 cows gave the owner $51.70 more profit than the other 32 cows. It shows very clearly that it is far better to keep a few very good cows than large herds of our ordinary cows. The work is less and profit larger.

SUMMARY.

Eight herds are reported in this bulletin, containing 144 cows that have completed a year's work. The eight dairies had 176 cows at the beginning of the test, but 32 of them were sold before the end of the year.

Some of the herds returned their owners a good profit, others a small profit, and one herd was kept at a loss. Six herds out of the eight contained cows that did not pay for the feed they consumed.

In estimating the profit or loss on a cow it was counted that the calf paid for her keep while dry and the skim milk paid for labor.

The cow that yielded the most product gave 8,949 pounds of milk, and made 472 pounds of butter. The poorest cow produced 1,482 pounds of milk, 68 pounds of butter, and the average production for all the herds, except Gurler's (D), was 4,721 pounds of milk, 3.67 percent fat, 173 pounds of butter fat, and 202 pounds of butter.

It would not give the average production of the ordinary cows in Illinois if Gurler's herd were included, for he has been applying the scales and test for a number of years, hence his improved dairy. It should also be considered that the men who took up this work had been interested in improving their dairies, and undoubtedly have better cows than the average.

The most profitable cow gave a net profit of $57.22 and the poorest cow was kept at an actual loss of $17.83. The average net profit was $9.96 per cow.

The above facts show clearly that the average production of the Illinois dairy cow can be doubled and the profit increased fourfold.

This can be done with little expense to the farmer. It will require better care and better feed for his stock, and the application of the scales and the Babcock test so that he can select and breed his animals more intelligently.

DISCUSSION.

Q. Are the different herds on the same basis?

A. They are all figured by the same method.

Q. The regular prices?

A. From the average of about 50 creameries, and I figured the hay and feed what we would receive for that upon the farm.

Q. In different sections they are worth different money?

A. I made an average and stated the average price of the corn.

Q. Do you figure each herd?

A. Yes, except one.

Q. How do you figure butter fat?

A. It is the pure oil the butter contains, about from 15 to 17 per cent. Then you add one-sixth to the butter fat to get the butter.

Q. I want to ask if the dairy literature is not putting too much stress on the form? I have a beef cow in form, and she is the best cow I have.

A. You will find the two types, and some good cows among the beef type.

Q. It is not necessary to have what is laid down as form to make the milker?

A. They are really the exception. I think there is something in the type, like horses, when they are built for travel first, if you want them to go

Q. Is there such a thing as a dual purpose cow?

A. Yes.

Q. Is Mr. Gurley breeding his cattle!

A. Yes, sir.

Q. What kind of sires?

A. Three full blood Holsteins. That is not because he likes Holsteins best, but he is making milk for babies in Chicago, and he wants them strong and vigorous.

Q. Did the cows produce the same amount of milk after they ran out of hay?

A. As far as I could see.

Q. We have a Jersey cow and she has been a good one. She is 8 years old and she ceases to be any good, what is the cause.

A. I can't tell you. Maybe she has nails in her stomach. I have seen that happen.

Mr. Newman—We have with us this morning Professor Erf, who will give us a practical demonstration of Milk Testing. This subject is quite important.

Chairman—While they are getting ready testing the milk we want to hear Mrs. Howie discuss this question of dairying for a few minutes.

DISCUSSION BY MRS. HOWIE.

Mr. Chairman, Ladies and Gentlemen—This morning I have had the pleasure ot listening to one of the best and most practical papers on dairying that I have ever heard. It is not all theory, for if you stop to think you will see that there has been good practical work right down in the cow barn, right with the cows, and I recommend very strongly the point made of making milk testing the standard for selecting and retaining your cattle.

While we are making rapid advances I am afraid we are putting the cart before the horse in many ways. For do you know we are testing the milk, selecting breeds and doing all of these things to improve and we are not considering the little working partner that stands in our barns. I have known people who wished to improve their herds and intend to better their methods that would at once build a magnificent barn. Yes they would build it so finely that perhaps they would put five or six lightning rods on top to show their intentions and then what would they do for the little working partners? They would begrudge them the comforts they were entitled to.

The first thought would be the savings of labor. Oh, yes, we must save labor rather than the comfort of the animal. What shall we do to save labor? By all means put in cement platforms. You can wash them off quick. A cement platform to lay upon. Make them sloping, by all means. Yes, and fasten them in firm. Put them in stanchions; hold their heads good and tight, so if they struggle they may dislocate their necks. Is that the way to do profitable dairying? Why don't you study the nature of the cow? If you will walk through your pasture you will see her lying with her head upon her side when she is resting. Try to make the same conditions. Make them as near natural as possible. I have seen a man—just to please his vanity—I have seen him, with a race horse, curry and comb it, dusting and wiping her glossy neck with a silk handkerchief, getting a harness light and adjusted in every strap and buckle, and get the lightest sulky that he could find, so that the horse might not be handicapped with an extra ounce of weight. But we dairymen, whose prosperity depends upon the little animal in the barn, put her head in the stanchion, instead of allowing her the rest she gets in an easy position. We are careless in feeding. We feed the heavy concentrates. Of course we are told to give so much corn meal, so we give it, no matter if it brings on garget. We put her on a sloping platform and give her any amount ot ensilage, without noticing the result, and then wonder at a scourge that has come to our herds. It is not difficult to see, when you consider the unnatural position. You will soon understand why there is trouble in your herd. If you wish to slope your platform, slope it a half inch—that is sufficient for drainage—and raise the bedding at the back, so the weight is thrown towards the shoulder. Be careful of your feeds. Be careful of heavy concentrates, because you will do untold damage to your herd.

You will say dairying does not pay. Begin at the foundation and work up and you will have something to build on. Thank you.

TESTING MILK DEMONSTRATION.

Prof. Escar Erb.

Mr. Chairman, ladies and gentlemen—I can always remember and never forget the statement once made by Daniel Webster. Daniel Webster was once visiting a friend of his; he being a great statesman, his friend thought he was equally capable of telling good cows and he took him out into the barnyard and he showed him the cows and said, "Now, Daniel, I want you to tell me which is the best cow? Daniel said, "Bring on the pail and I will tell you."

Now, you have heard all about rations and individual animals. The point is how to get an efficient and how tell a good cow. Is it by the type? No always. Well, what is the surest method, then? It is the product that you produce. That is the surest method, and since the milk pail was the only thing Daniel had to rely upon at that time it was certainly a very sure method. At the present time we simply add the scales and the Babcock test. It is my purpose here today to demonstrate to you the test, the Babcock test, showing its simplicity and showing that it can be operated by any dairyman, or any man that keeps a cow or even if he is a consumer of milk and does not keep cows. I believe the day will soon be here when every citizen and every milk consumer that buys milk for his own use will have a Babcock test and tell what he is drinking.

Now, I can not help but think of a little story. At one time there was an old lady very ill, and she called in a doctor and she said, "Now, doctor, I want you to tell me what ails me?" The doctor said, "I can't diagnose the case but a post mortem will reveal it."

The Babcock test is the post mortem revealer.

The first operation with the Babcock test is to get an accurate sample, have an accurate sample of milk. There are little details which may lead you into error which you must take into consideration in testing milk and the first one is, and it is an important one, to get an accurate sample, milk your cow and after the cow is milked thoroughly mix the milk by pouring the pail of milk into another pail or stir it up with the dipper and that will give you the average amount of butter fat in the milk. The reason we do that is this: If you test the first milk of the cow you will find it will run anywhere from 1 per cent to 2 per cent and up to 3 per cent with some of them and the last of the milk will run from 8 to 12 per cent. Hence in order to get an average sample you have to milk the cow and take an average sample.

In making a composite test you put the milk in a bottle of this nature putting in an aliquoit part of milk every time. This is easily illustrated by taking wheat and oats. Suppose you had a bushel of wheat here and a sample of oats. I take the sample of the wheat and take an equal amount of the oats and put it in a bottle and mix the two together and I have wheat and oats. Suppose I put the two bushels of wheat and one of oats and what have I? I would have one-third oats and two-thirds wheat. To the different percentage of milk is the difference the wheat and oats. The easiest way is to take aliquoit parts. So I take a tube, a round tube about ¾ or ½-inch in diameter and drop it into the bottle and the oil in the milk bottle and the oil in the tube will be equal, and hence we will get an aliquoit part. Shake your sample thoroughly, some cream rises and you want it down in the milk. After you have shaken the milk and seen that it is properly mixed, put a sample into one of these bottles that are graduated to 10 per cent. After the sample is in the bottle take sulphuric acid 1.10 of 1 per cent less of acid added to the milk will decompose the casine, the milk sugar and the ash, and when shaken up it will turn a black color and produce heat. See that the decomposition is going on. This does not work very fast when you want it to.

You next put it into the centrifugal machine which brings up the butter fat. The casein, the milk sugar and the ash have been decomposed. This being the milk, sugar of the milk, this being the casein and this the ash. These three constituents are decomposed by the sulphuric acid, this being left, and hence, this being of a right specific gravity will bring the fat to the top of the surface. The centrifugal force simply increases the force and does it more rapidly. The amount of acid required with some milk depends upon the temperature or the strength of the amounts or the proper amount to take the proper strength must be 1.82 if you have milk at 60 degrees. These two amounts will exactly decompose and liberate the fat and give it a clear color and set it free from the other constituents. Now, then, if the milk is cold it requires more heat, and hence, you must have a stronger acid or use more. If you have warmer milk you must use less acid of the same strength, or you must use less acid, at the same time more of the water. Now, then, after the milk has been revolved in this centrifugal machine we add some water to bring up the butter fat.

This second running after the water has been added will bring the fat up into the neck of the bottle where it can be read on the graduation on the neck of the bottle. Now, in reading the test, you must always read from the extreme top of the column to the extreme lowest point. You will notice by looking at one of these bottles close that it is heaviest at the bottom and the space is not entirely filled with fat between the extreme top and base, but it is supposed to be equal to the fat left in the bottle. Some of the fat globules are too small to be brought up, and hence we make an allowance by reading from the extreme top to the extreme base. This brings the fat out as you see in the column which can be easily read, three-quarter this particular milk.

In passing this around, be careful you don't spill it, because the sulphuric acid will burn. This finishes the test, and shows the simplicity with which you can determine the value of your cow and of the milk you buy.

Now, in order to calculate the pounds of butter fat in this milk, I will say that if this milk test 4 per cent you have 100 pounds of milk and it will be four one hundredths times 100, or four pounds of butter fat. Now the butter is increased by one-fifth to one-sixth or one-seventh; that is to say, if you have six pounds of butter fat you can make seven pounds of butter out of it.

Now, as my time is short, I will just close, merely saying that this is one of the simplest operations that can be made on the farm, and one of these outfits will not cost you more than $4 or $5. Anybody that has the least idea of handling chemicals or doing ordinary work, weighing, etc., can easily handle one of these and learn the standing of their cows.

Q. How about the temperature of the water?

A. I forgot to mention that. The water ought to be at 140 degrees. That you add to the bottle, in order to keep the fat in a liquidated condition.

Q. What is the temperature of the milk?

A. The temperature may be 60 degrees when you start in.

Chairman—I am sorry, but on account of time we will have to proceed with the program.

Violin solo by Miss Smith.

Chairman—It is very sweet to have our next speaker ushered in with a young Pagannini. Prof. Hopkins will tell you what has been done by nearly two years' work in the study of the soil.

METHODS OF MAINTAINING THE PRODUCTIVE CAPACITY OF ILLINOIS SOILS.

(By Cyril G. Hopkins, Ph. D., Chief in Agronomy and Chemistry.)

If the greatest study of mankind is Man, the next greatest study is the soil; for, upon the soil depends the preservation of man.

If it is true that American agriculture is the fundamental support of the American nation, it is equally true that soil fertility is the absolute support of American agriculture.

If he who makes two blades of grass grow where but one grew before is a public benefactor, then he who reduces the fertility of the soil so that but one ear of corn grows where two have been grown before is a public curse.

The fertility of Illinois soils ought not and need not be reduced; Illinois land ought never to be reduced below its original productive capacity.

The only system of maintaining soil fertility which I can advocate and which can ever safely be adopted as a permanent system must be a system which can be applied to all of the soils of this State—not to a few farms only, or for a few years only, but to all the soils of Illinois, and for all time—yes, even more than that—it should be a system which can be applied to the soils of adjoining states—to Indiana and Ohio, to Wisconsin and Iowa—in short, to the soils of America.

How shall the fertility of the soil be maintained? We hear two very common answers to this question:

The grain farmer says we must grow clover.

The live stock farmer says we must put the manure back on the land.

But neither of these answers really answers the question.

Clover will not maintain the fertility of the soil, and, if all of the crops which are grown on the farm are fed on the farm and the manure all returned to the land, it will not maintain the fertility of the soil, not even if clover is also grown. The only way by which the live stock farmer can maintain the fertility of his soil by the use of manure is to feed, not only his own crops, but his neighbors' crops also, and then put all the manure upon his own land.

This answers the question for a few farmers who are also extensive cattle feeders, but it does not answer the question for Illinois; it does not answer the question for America—we can not all feed our own crops and our neighbors' crops also.

How then shall we maintain the fertility of Illinois soil!

There is but one answer to this question, and this answer would have saved the fertility of all the soils which have been ruined in past ages. It would have saved the soils of Palestine, a land which once flowed with milk and honey, but is now a barren waste. It would have saved the soils of Greece, and of Italy, of northern Europe and of eastern United States, and it is the only answer which will save the soils of Illinois—and this is the answer:

Preserve good physical conditions and then put back upon the land all of the fertility which is taken off—not some of it, not most of it, but all of it; and not only that which is removed by cropping, but also that removed by the blowing, washing or leaching of the soil.

The whole subject of plant food is a simple one. About 95 per cent of most agricultural plants consist of the three elements, carbon, hydrogen and oxygen, which are obtained from air and water.

Only seven essential elements are furnished by the soil, and four of these, calcium, magnesium, iron and sulphur, are used by plants in such small amounts, and are contained in all ordinary soils in such large amounts, that they are practically never exhausted from the soil.

The productive capacity of practically all soils in good physical condition is measured by the available supply of the three elements, nitrogen, phosphorus and potassium. These are the elements which are present in nearly all soils in comparatively small amounts, and yet are absolutely required by all agricultural plants, and in very considerable quantities.

How shall the fertility of the soil be maintained? By maintaining the supply of nitrogen, phosphorus and potassium and preserving good physical conditions. How shall the productive capacity of a soil be increased? By increasing the supply of that element which is most deficient in the soil.

The live stock farmer understands the value of a balanced ration in stock feeding. Let us also bear in mind that plants are living things, and that balanced rations are of even greater importance to them than to animals. Timothy hay and corn and cob meal have some place in animal feeding, but they do not make the best possible balanced ration for young cattle or milk cows, nor could you make a balanced ration by adding to them excelsior straw and sawdust meal. Likewise a plant which is starving for phosphorus is not benefited by plowing under a crop of green rye or even by feeding it more nitrogen or potassium; indeed such treatment would tend to still further unbalance the soil, and might even produce an injurious effect upon the plant, as appears to have been the case to a slight extent in some experiments. [See Table 7, (a) 8 and (b) 7.]

SPECIAL NOTE.—The tables given in this circular have been prepared with very great care. They may not be very entertaining to the careless reader; but to any one who is willing to take some time to study them, to compare one with another—in short, to do some real thinking along these lines—to such a one these tables contain a large amount of very useful and valuable information bearing directly upon the business of farming and the science of agriculture.

By referring to Table 1, which is self explanatory, one may see some of the absolute requirements of different kinds of farm produce for the different elements of plant food.

TABLE 1.—FERTILITY IN FARM PRODUCE.

(Approximate maximum yield per acre.)

Produce.		Pounds.			Value.			
Kind.	Amount.	Nitrogen ...	Phosphorus...	Potassium...	Nitrogen ...	Phosphorus...	Potassium...	Total value...
Corn, grain	100 bu.	100	17	19	$15 00	$2 04	$1 14	$18 18
Corn stover.............	3 tons	48	6	52	7 20	72	3 12	11 04
Corn crop	....	148	23	71	$22 20	$2 76	$4 26	$29 22
Oats, grain	75 bu.	45	7	9	6 75	84	54	8 13
Oat straw	2 tons	24	4	40	3 60	48	2 40	6 48
Oat crop	....	69	11	49	$10 35	$1 32	$2 94	$14 61
Wheat, grain	40 bu.	46	6	11	6 90	72	66	8 28
Wheat straw............	2 tons	19	4	34	2 85	48	2 04	5 37
Wheat crop	....	65	10	45	$9 75	$1 20	$2 70	$13 65
Timothy	2 tons	48	6	47	7 20	72	2 82	10 74
Clover....................	3 tons	120	15	90	18 00	1 80	5 40	25 20
Cowpea hay.............	3 tons	140	14	95	21 00	1 68	5 70	28 38
Alfalfa	8 tons	400	36	192	60 00	4 32	11 52	75 84
Apples	600 bu.	47	2	57	7 05	24	3 42	10 71
Leaves	4 tons	59	7	47	8 85	84	2 82	12 51
Wood growth	1/5 tree	6	2	5	90	24	30	1 44
Total crop...........	....	112	11	109	$16 80	$1 32	$6 54	$24 66
Potatoes	300 bu.	63	13	90	9 45	1 56	5 40	16 41
Sugar beets.............	20 tons	100	18	157	15 00	2 16	9 42	26 58
Fat cattle	1,000 lb.	25	7	1	3 75	84	06	4 65
Fat hogs	1,000 lb.	18	3	1	2 70	36	06	3 12
Milk	10,000 lb.	57	7	12	8 55	84	72	10 11
Butter....................	500 lb.	1	0.2	0.1	15	02	01	18

The table is arranged to show the number of pounds of each element required by different kinds of produce on the basis of approximate maximum yields per acre. Of course, proportionate amounts would be required for any other yields which one may wish to consider, but I think we should be most interested in knowing the amount of plant food required to make maximum yields.

The total value of the elements is computed on the basis of the present market values—

Nitrogen, 15 cents a pound.
Phosphorus, 12 cents a pound.
Potassium, 6 cents a pound.

It should be borne in mind that the principal value given is for the element nitrogen, which, however, the farmer does not need to purchase. The total quantity of phosphorus or potassium required by crops could be supplied at very moderate cost.

I offer the following simple rules for improving soils and feeding plants:

Rule 1—If the soil is acid or sour, apply lime to it to make it sweet.

Rule 2—If the soil is poor in nitrogen only, grow clover or some other legume which has the power to secure nitrogen from the air.

Rule 3—If the soil is poor in phosphorus only, apply bone meal or some other form of phosphorus.

Rule 4—If the soil is poor in potassium only, apply potassium chlorid or some other form of potassium.

Rule 5—Always save and use all the barnyard manure you have, and also all you can economically obtain from others, and make liberal use of green manures when necessary to maintain the supply of organic matter in the soil.

In connection with these five rules for improving soils and feeding plants, I offer the following suggestions:

1. REGARDING LIME

Lime is the only material which we can use for correcting the acidity of soils. It may be used in several forms: (1) Fresh burned quicklime, which is calcium oxid, a compound of the elements calcium and oxygen; (2) fresh slacked lime, which is calcium hydroxid, a compound of quicklime and water; (3) old air-slacked lime, which is calcium carbonate, a compound of quicklime and the carbon dioxid from the air; (4) fine ground limestone, which also is calcium carbonate, exactly the same as old air-slacked lime; (5) marl, which also contains calcium carbonate, the same as limestone.

Any of these five different forms of lime may be used to correct the sourness, or acidity, of soils, and after the acidity of a soil is once corrected, probably half a ton of lime per acre once in five years will be enough to keep the soil sweet. From the knowledge which we have thus far obtained, we believe that old air-slacked lime, fine ground limestone and marl are the most economical forms of lime to use.

Fresh burned lime (quicklime) can be delivered in bulk at almost any point in Illinois for $5 a ton in car load lots.

Slacked lime can be bought from J. B. Speed & Co., Louisville, Ky., in 100-pound bags, on board cars at their works at Milltown, Ind., for $2.50 a ton, if the empty bags are returned in good condition. The freight rate is $1 to $1.20 per ton in car load lots to such points as Centralia, Olney, Salem and Odin.

Old air-slacked refuse lime can frequently be found in large quantities lying about the limekilns in different parts of the State. It often contains some cinders and some lumps of stone which could be easily screened out. I believe lime companies could screen this material and place it on the cars for about 50 cents a ton, provided they could sell large quantities of it.

Fine ground limestone is now offered for sale by the Crystal Carbonate Lime company, of Elsberry, Mo., for $1 per ton in bulk, loaded on the cars at Elsberry. The special freight rate on this material to some points in central Illinois (Springfield and Peoria) is 80 cents to $1 a ton, in car load lots. The Mitchell Lime company, Mitchell, Ind., have quoted fine ground limestone, delivered at Odin, Centralia, Mt. Vernon, etc., for $2.70 per ton in bulk in car load lots. A plant for grinding limestone to a fine powder can be erected at a cost of less than $8,000; and, with the abundance of excellent limestone in different parts of Illinois, there is no reason why we should not have fine ground limestone delivered at any point in Illinois at very moderate cost.

Although our absolute knowledge upon the subject is still meager, my opinion is that fresh burned lime or fresh slacked lime will not prove to be the best form of limes to use, partly because they evidently have a tendency to attack and destroy the organic matter of the soil, or "burn the land," as some say, and partly because the natural products (as ground limestone) are less disagreeable to handle. In power to neutralize acids, 56 pounds of quicklime would be equivalent to 74 pounds of fresh slacked lime and to 100 pounds of ground limestone, provided that all materials were perfectly dry and pure, and further provided that the full force were exerted in neutralizing soil acids, which is certainly the case with ground limestone, while with fresh burned lime (quicklime) and fresh slacked lime the force or power is evidently partly used up in destroying organic matter, although the destruction of organic matter can not be very large. As stated before, any of these forms of lime may well be used, but with quicklime at $5.00 a ton, fresh slacked lime at $3.70 a ton, and lime carbonate (ground limestone) at $2.80 a ton, I would prefer to use the ground limestone.

As a rule, raw products are cheaper than manufactured goods, and let us bear in mind that the lime naturally in the soil is in the form of ground limestone; and I may add that the phosphates and potash salts naturally in the soil are also in the form of pulverized or finely divided rock, more or less decomposed by natural agencies.

3. REGARDING NITROGEN.

If any question pertaining to the science and practice of agriculture is settled, it is this—that the atmosphere is the most economical source of nitrogen for all general farming; but let me ask you to bear in mind: (1) that neither clover nor alfalfa nor cow peas nor soy beans nor any other leguminous crop is able of itself to secure nitrogen from the air, but that each different legume must be provided with the particular species of bacteria which has the power to live upon its roots and to gather atmosphic nitrogen for its use: (2) that these nitrogen-gathering bacteria will not live in strongly acid soils and will not properly develop in any soil which needs lime: (3) that leguminous crops do not live upon nitrogen alone, but they must have both phosphorus and potassium, although deep rooting legumes, like alfalfa, when once well started are usually able to obtain large supplies of those elements from the lower subsoil.

3. REGARDING PHOSPHORUS.

So far as I have discovered, in all other things Illinois farmers are intelligent, progressive, consistent, and unprejudiced; but, regarding the use and value of that element of fertility which limits the productive capacity of a large proportion of Illinois soils, I am compelled to say that Illinois farmers, as a rule, are inconsistent, if not actually prejudiced.

Phosphorus is the one element of fertility above all others which has a high absolute and permanent value to Illinois farmers.

Nitrogen is free as air and potassium is abundant in nearly all of the soils of the State and both nitrogen and potassium remain in the straw and corn stalks and in the farm manures to a considerable extent. Phosphorus, on the contrary, is present in nearly all soils in limited amounts and it is being continually removed from the land both by grain farming and live stock farming, although two or three times faster by grain farming than by the live stock system of farming. The sin of the live stock farmer the same as that of the grain farmer; the only difference is in degree. As a rule, the sins of the grain farmer will fall upon his own head, while the sins of the live stock farmer will fall more heavily upon his children.

The phosphorus which is taken from the soil by plants is largely stored in the seed or grain, and thus the grain farmer sells it from the farm. If the grain is fed to animals, from one-third to one-half of the phosphorus is stored in the animals' bones, and thus the live stock farmer sells it from the farm.

I have talked with many Illinois farmers about using bone meal on their soil, and not infrequently some one looks at me as though I were a traitor to the cause of better agriculture in Illinois, and he says: "Then you advocate the use of commercial fertilizers."

Is it not a shame to call bone meal a commercial fertilizer? Pure bone meal is not a commercial fertilizer in the ordinary sense; it is not a manufactured article; it is a farm product, and any method of reasoning which justifies the use of farmyard manures will justify the use of bone meal upon the land from which it came.

In this connection let me say that I do not advocate the use of highly manufactured commercial fertilizers upon Illinois soils, not even the indiscriminate use of mixed fertilizers; and from what information we now have I strongly advise against the use of any acidulated fertilizers, such as "dissolved" bone, acidulated bone meal, acid phosphates, superphosphates, or any other fertilizers which have been treated with sulphuric acid or oil of vitrol. Of course, I am aware that these acidulated phosphates are readily available and may give quick returns and some profit, but I am also convinced that they are too expensive and that, as a rule, their continued use works no permanent good to the land. The opinion held by many eastern farmers that they ultimately injure or "burn" the land is evidently not without some foundation; and I fear that the acid soils of Illinois would not be permanently benefited by the use of acid phosphates. On the other hand, when acid phosphates are used with lime or applied to soils which naturally contain an excess of lime, the soluble phosphate reacts with the lime and quickly reverts to a form which is no more readily available than some non-acidulated phosphates.

I believe there are only three forms of phosphorus which should be considered for use on Illinois soils:

1. Fine ground bone meal.
2. Fine ground rock phosphate.
3. Fine ground slag phosphate.

I prefer steamed bone meal to raw bone meal, partly because the steamed bone meal acts more quickly in the soil, and partly because, for its phosphorus content, the steamed bone is cheaper. The nitrogen contained in the raw bones is charged for at about 15 cents a pound, but by steaming the bones the nitrogen is largely removed in the form of glue, and the steamed bone is then sold almost wholly for its phosphorous content. Even steamed bone meal still contains some nitrogen, which is of course no objection to its use, although it adds but very little to its real value for the ordinary farmer, as he can obtain nitrogen from the atmosphere at very small cost, by proper use of leguminous crops, if his soil is in suitable condition. Bone meal should be bought only on the basis of its phosphorus content.

The best steamed bone meal contains about 12 to 13 per cent of phosphorus, which at 12 cents a pound would give it a value of $30 per ton. It can usually be bought from fertilizer dealers in Chicago (as Nelson Morris & Co., Armour Fertilizer Works or Swift & Co.) for about $28 a ton, in 200-pound bags, delivered at points in Illinois. Somewhat poorer grades are sold at lower prices. (Phosphorus is commonly sold under the name of phosphoric acid, by which is meant a compound of phosphorus and oxygen, containing 43⅔ per cent of the element phosphorus. Consequently, if phosphorus is worth 12 cents a pound, this compound, "phosphoric acid," is worth about 5 cents a pound)

Fine ground rock phosphate, containing 12 to 13 per cent of phosphorus, can be bought from Robin Jones of Nashville, Tenn. (and probably from other dealers), for $4 a ton in bulk (or $4.40 in bags), on board the cars at the mines, and the freight rate now in effect from the mines in Tennessee to

Chicago is $3.22 per ton of 2,000 pounds. Thus, this material can be delivered in Illinois for $7 or $8 a ton. As it is just as rich in phosphorus as good steamed bone meal, the phosphorus in the rock would cost only 3 cents a pound. In other words, the 17 pounds of phosphorus contained in 100 bushels of corn would cost $2.04 if bought in the form of bone meal, while it would cost only 51 cents if bought in rock phosphate. In bone meal the phosphorus for a bushel of corn costs 2 cents; in rock phosphate it costs one-half cent. In either case the cost is small as compared with the total cost of the corn crop. If we buy the land and plow the ground, prepare the seed bed, plant the seed, cultivate the corn and harvest the crop, why not give some consideration to feeding the plant, especially when the cost of all the farm operations in growing the corn crop is just the same, whether we grow 37 bushels or 100 bushels to the acre.

It seems very probable that the phosphorus in the rock phosphate will be less readily available than in the bone meal, but, if four or five times as much rock phosphate is used, its effect will probably be observed just as soon and it will certainly be much more lasting than the effect of the bone meal.

Slag phosphate is simply the finely ground slag produced in the manufacture of steel from iron made from ores which are rich in phosphorus. The best slag contains about 8 per cent of phosphorus and it also contains some excess of lime which is added to the converter in which the iron is converted into steel. The amount of lime which the slag phosphate contains would probably add somewhat to its value for use on Illinois soils, many of which are already in need of lime; but at the present time no slag phosphate is produced in this part of the country, the iron ores used by the Illinois Steel works being very poor in phosphorus. Considerable quantities of slag phosphate are produced in Pennsylvania, and are being used on the soils of the eastern states. Slag phosphate can be obtained from Jacob Reese, Pottstown, Pa

The phosphorus fertilizers which are commonly used in the United States are the most expensive kinds obtainable. They are highly manufactared articles. This is largely due to the fact that most farmers who use fertilizers demand a kind which can be applied when the seed is sown and then be completely available for use of that crop. They may spend $1 to save 10 cents' worth of time and interest, and at the end of the year leave the land in worse condition than they found it at the beginning. Of course, the manufacturer caters to this demand. For example, he takes, one ton of sulfuric acid (oil of vitrol) worth $12, and he then has two tons of an acid phosphate which sells in Illinois for about $18 a ton, or $36 for the two tons of product containing no more phosphorus than is contained in one ton of the original rock phosphate which could be delivered in Illinois for about $7, or for one-fifth of the cost of the manufactured product. Of course the manufacturer must have pay for handling the sulfuric acid, for mixing it with the rock, and for bags and freight for two tons of material which he is compelled to handle.

If it is true that the farmers of the eastern and southern states can use this highpriced acid phosphate in a hand-to-mouth way, buying more or less nitrogen and potassium at the same time, and still make some profit on lands which are poorer than Illinois soils in all other elements than phosphorus, it is certainly highly probable that Illinois farmers could profitably supplement their farm manure and clover fertilizers with steamed bone meal, or natural rock phosphate, neither of which can ever injure the soil in the least; and thus by applying large amounts of lowpriced phosphorus fertilizers they would cause the productive capacity of the land to gradually increase instead of allowing it to slowly decrease, as under the present system of farming.

4. REGARDING POTASSIUM.

If a soil is rich in all elements of plant food except potassium, that element can be supplied with marked profit, either in the form of potassium chlorid (commonly, but incorrectly, called "muriate of potash") or potassium sulfate or kainit. The potassium chlorid contains about 42 per cent of the element potassium, and sells at about $50 a ton in Chicago. The potassium sulfate contains about 40 per cent of potassium, but it sells for about $55 a ton, the sulphate being somewhat more agreeable to handle than the chlorid, and it is also preferred for use with some particular crops not grown in this State. Kainit is a crude potash mineral, containing about 10 per cent of potassium. It sells for about $16 a ton. It will be seen that potassium chlorid is somewhat the cheapest form of the element potassium, although kainit gives very good results and is very largely used where potassium is the only element required. (Potassium is usually sold under the name of potash, a compound of potassium and oxygen, containing 83 per cent of the element potassium. If the element is worth 6 cents a pound, the compound called potash is worth about 5 cents.)

5. REGARDING FARM MANURE.

Manure is a complete fertilizer; that is, it contains some of all of the elements of fertility; but manure is not a well balanced fertilizer, because it contains too little phosphorus, much of the phosphorus being retained in the bones of the animals, while the bedding or litter is usually poor in that element. [See Table 2 for phosphorus content of straw and corn stalks.] Manure does contain a small amount of phosphorus, but it is much more valuable for the potassium and nitrogen which it contains and also for the humus, or organic matter, which it adds to the soil, and sometimes for the soil bacteria which it also supplies to the land. Farm manure always has been, and without doubt always will be, one of the principal materials used in maintaining the fertility of Illinois soils; but, as a rule, it is not well bal-

TABLE 2. FERTILITY OF MANURE, ROUGH FEEDS, AND FERTILIZERS.

Name of Material.	Pounds per Ton.			Value per Ton.			
	Nitrogen	Phosphorus..	Potassium...	Nitrogen	Phosphorus..	Potassium...	Total value..
Fresh farm manure.......	10	2	10	$ 1 50	$ 0 24	$ 0 60	$ 2 34
Corn stover................	16	2	17	2 40	24	1 02	3 66
Oat straw..................	12	2	20	1 80	24	1 20	3 24
Wheat straw	10	2	17	1 50	24	1 02	2 76
Clover hay.................	40	5	30	6 00	60	1 80	8 40
Cow pea hay..............	43	5	33	6 45	60	1 98	9 03
Alfalfa hay	50	4	24	7 50	48	1 44	9 42
Dried blood................	280	....	....	42 00	....	....	42 00
Sodium nitrate............	310	....	....	46 50	....	....	46 50
Ammonium sulfate	400	....	....	60 00	....	....	60 00
Raw bone meal............	80	180	....	12 00	21 60	....	33 60
Steamed bone meal	20	250	....	3 00	30 00	....	33 00
Acidulated bone meal.....	40	140	....	6 00	16 80	....	22 80
Slag phosphate............	....	160	....	....	19 20	....	19 20
Rock phosphate	....	250	....	....	30 ?	....	30 ?
Acid phosphate	....	125	....	....	15 00	....	15 00
Potassium chloride (muriate of potash)	....	....	840	....	....	50 40	50 40
Potassium sulfate (sulphate of potash).........	....	....	800	....	....	48 00	48 00
Kainit........................	....	....	200	....	....	12 00	12 00
*Wood ashes, unbleached.	....	10	100	....	1 20	6 00	7 20

* Wood ashes also contain about 1,000 pounds of lime carbonate per ton.

anced, and there are some things which it can not do. For example, it can not correct an acid soil and it can not maintain the supply of phosphorus in the soil unless much more manure is used on a given farm than can be made from the crops produced on that farm alone. (At the full market price for phosphorus, 12 cents a pound, a ton of fresh manure is worth about 24 cents for its phosphorus content.) As a very general rule, farm manure should not be replaced in maintaining or increasing the fertility of the soil, but, if necessary, it should be supplemented—by lime and by some form of phosphorus, as bone meal or rock phosphate. On some few soils, however, such as peaty lands, the use of farm manure may well be entirely replaced by the use of potassium fertilizers, as will be shown later. [See Table 6—peaty swamp soil.] Peaty soils contain an abundance of both nitrogen and humus, the two constituents for which manure is most valued. Manure is most useful on soils which are deficient in humus, upon the supply of which the soil is largely dependent for its capacity to absorb and retain moisture, and thus to resist drouth. As a source of humus, however, manure may well be supplemented, and, if necessary, entirely replaced by any other organic matter, including green manure crops, although, if heavy crops of green manures are added to the soil, care must be taken that the soil contains sufficient lime to keep it sweet, as considerable acidity is produced by the decomposition of the fresh organic matter.

Table 2 gives the average quantities in pounds per ton of the different valuable elements of plant food contained in ordinary manure, in litter and rough feeds, and in some fertilizers.

It will be observed that a ton of the best steamed bone meal or a ton of the richest rock phosphate contains about 125 times as much phospherus as a ton of fresh manure; while a ton of potasium chlorid, 80 per cent pure, as commonly sold on the market, under the name of "muriate of potash," contains about 84 times as much potassium as a ton of manure.

By referring to Table 1 and table 2, it will be seen that about two tons of fresh manure would furnish as much potassium as 100 bushels of corn would remove from the soil, while the 100 bushels of corn would remove four times as much phosphorus and five times as much nitrogen as the two tons of manure would furnish. Thus for our common system of harvesting corn (leaving the stalks in the field) we have the problem in pounds of fertility as follows:

POUNDS OF FERTILITY.

	Nitrogen.	Phosphorus	Potassium.
100 bushels of corn contain	100	17	19
2 tons of farm manure contain	20	4	20
Difference	80	13	....
100 pounds of bone meal to balance	....	13	....
Balance still due	80	....	....

Of course the balance of nitrogen can be most economically supplied by the growing of leguminous crops, but unless one has unlimited quantities of manure he will find it a wise and profitable practice on soils needing phosphorus to balance his ration for corn by applying bone meal or rock phosphate with his manure and clover fertilizer. The Ohio Experiment Station has shown that the value of manure is increased 30 per cent by adding to it a small amount of fine ground rock phosphate, even after paying the cost of the rock phosphate; and this value has been measured in actual increase in crop yields.

The rock phosphate or bone meal can be mixed with the manure as it is made, using about one pound for each animal per day or it can be spread on the field with the manure, preferably perhaps with a manure spreader; or it can be sowed by itself with an end gate seeder.

As already stated the fertility of the soil can be maintained or even increased by the use of farm manures alone; but much more manure will be required than can be produced from the crops grown on the farm. In the famous experiments which have been conducted for more than sixty years at Rothamsted, England, the average yield of wheat has been maintained, by use of farm manures alone, at more than thirty bushels of wheat per acre. But how has this been done? By applying fourteen tons per acre of good barn yard manure every year. But who can make fourteen tons of good manure from the refuse left from a 30 bushel crop of wheat?

It is an easy thing, and usually it is a popular thing, to say that farm manure and legumes are the only fertilizers you need to use, and that the purchase of any other fertilizer is a waste of money; but I would indeed be a traitor to Illinois agriculture if I allowed myself to spread abroad this popular opinion.

I know and you know, that even the average Illinois live stock farmer not only does not and cannot apply I4 tons of manure per acre every year, but as a rule he cannot make an application of eight tons of manure per acre more than once in four years; while as a matter of fact what he actually does do is usually to scatter the manure over a few thin places near the barn and give the remainder of his farm an occasional "rest" by pasturing.

Whenever you can make two minus one equal two, then you can maintain the fertility of the soil without putting back as much plant food as is taken off. The merchant buys and sells and buys again, but the farmer usually sells and sells, util he is practically "sold out." Then he "goes west," and with him "westward the course of empire takes its way." Is not this the history of the civilized world?

THE APPLICATION OF MINERAL FERTILIZERS.

There is one general rule to be observed in the application of fertilizers; namely, thoroughly mix them with the soil. Apply them uniformly and make them a part of the soil itself—by disking, dragging, plowing, harrowing, cultivating—any way to get them thoroughly incorporated with the soil. At least one year's time will usually be required to fully produce this effect.

I am often asked if it is a good plan to apply the fertilizer in the hill with corn. This is very poor practice. The effect of such an application is usually to over stimulate the early growth of the corn, meanwhile the roots do not properly develop and spread through the soil in proportion to the growth above ground, and consequently when the drier season comes on and earing time approaches, the corn fertilized in the hill suffers more than the unfertilized corn and frequently produces a similar yield of ears at harvest time.

People sometimes ask when is the best time to apply fertilizers. I think almost any time will do well, if it is about a year before you expect marked results. Fertilizers may well be applied whenever you can get on the land and are not too busy with other work. Probably as good a practice as any is to apply them in the fall or spring and then cultivate the land in corn and follow the next year with oats and clover. The effect should be apparent on the clover and it should be marked on a succeeding corn crop.

Heavy applications; that is, from 600 or 800 pounds to one or two tons per acre, may well be applied broadcast as uniformly as possible with a shovel or preferably with a manure spreader, by putting in the box a uniform layer of the material, which may well be applied with the manure. Lighter applications may be made with an end gate seeder or with a fertilizer drill. For lime or heavy applications of rock phosphate, I would advise using the manure spreader; for bone meal or potash salts, or moderate applications of rock phosphate (300 to 600 pounds), use the end-gate seeder, or fertilizer drill, or even a good force-feed grain drill. In case both phosphorus and potash potash salt need to be applied to the soil, which is rarely the case, a force feed grain drill with fertilizer attachment is probably the best implement to use, running the bone meal or rock phosphate through the grain box and the potash salt through the fertilizer box.

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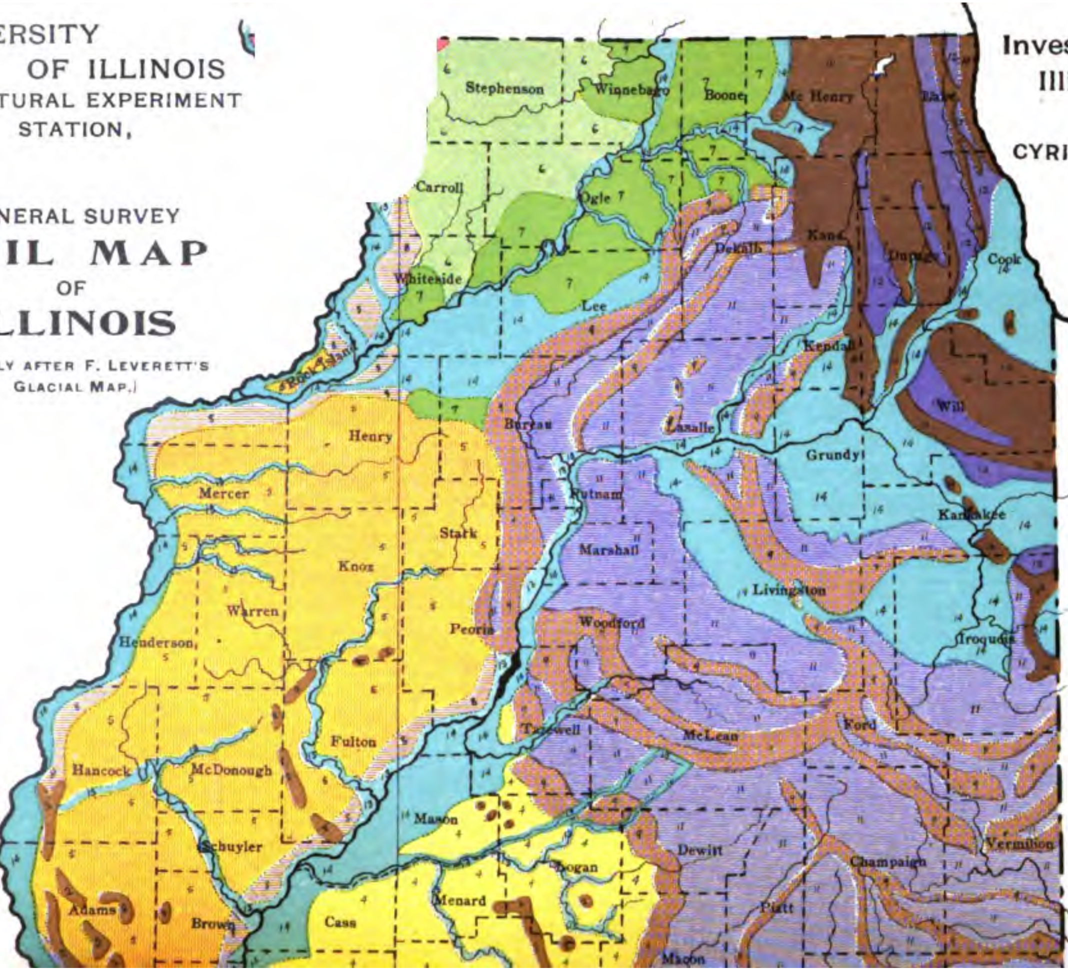
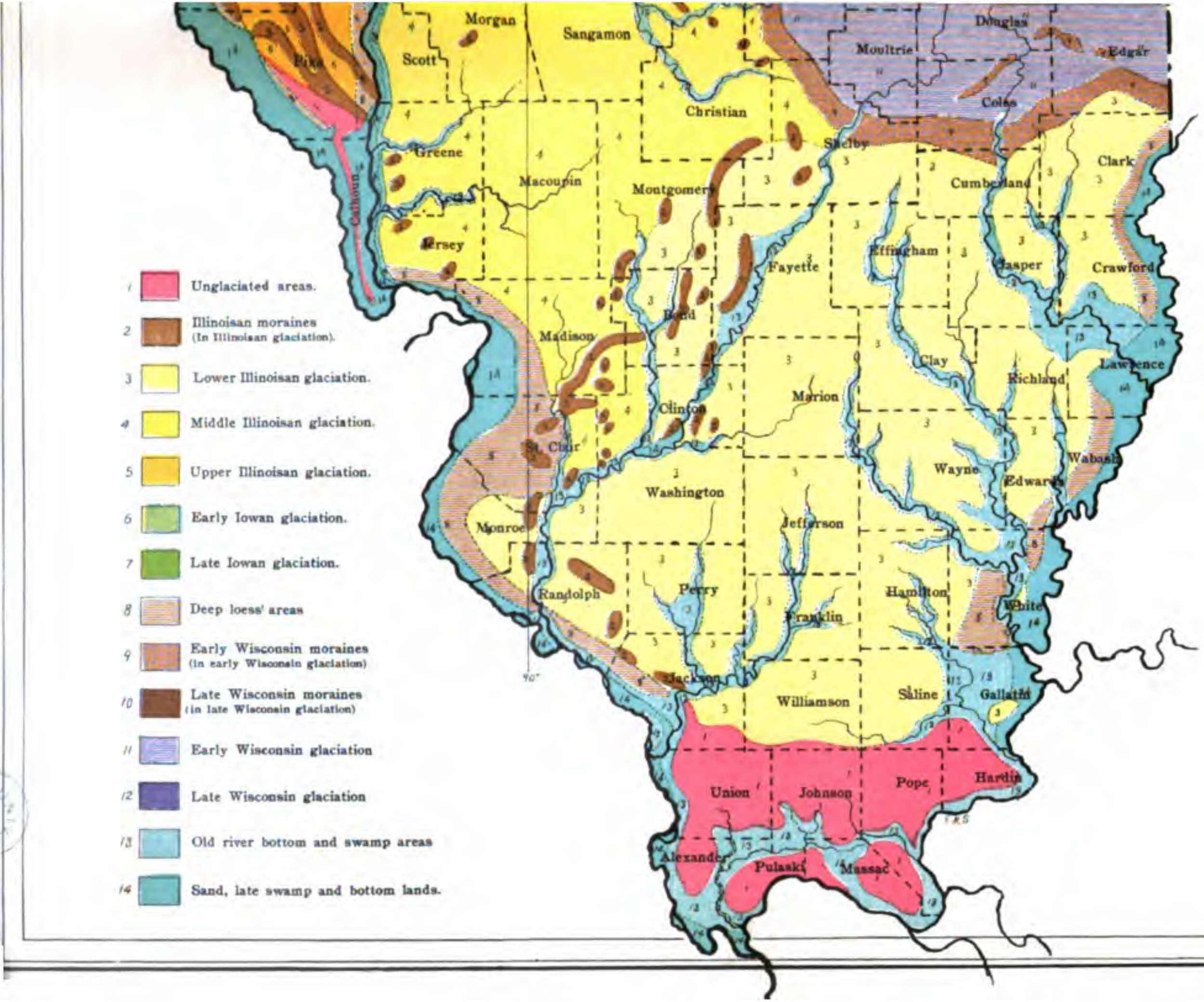
OF ILLINOIS
AGRICULTURAL EXPERIMENT
STATION,

GENERAL SURVEY
SOIL MAP
OF
ILLINOIS
(CHIEFLY AFTER F. LEVERETT'S
GLACIAL MAP.)



Investigation of
Illinois Soil.
BY
CYRIL G. HOPKINS


1 Unglaciated areas.
2 Illinoisan moraines (In Illinoisan glaciation).
3 Lower Illinoisan glaciation.
4 Middle Illinoisan glaciation.
5 Upper Illinoisan glaciation.
6 Early Iowan glaciation.
7 Late Iowan glaciation.
8 Deep loess' areas
9 Early Wisconsin moraines (in early Wisconsin glaciation)
10 Late Wisconsin moraines (in late Wisconsin glaciation)
11 Early Wisconsin glaciation
12 Late Wisconsin glaciation
13 Old river bottom and swamp areas
14 Sand, late swamp and bottom lands.
Morgan
Sangamon
Scott
Pike
Christian
Moultrie
Douglas
Edgar
Coles
Shelby
Greene
Calhoun
Macoupin
Montgomery
Cumberland
Clark
Jersey
Fayette
Effingham
Jasper
Crawford
Madison
Bond
Clay
Richland
Lawrence
Clinton
Marion
St. Clair
Washington
Wayne
Edwards
Wabash
Monroe
Jefferson
Randolph
Perry
Hamilton
White
Franklin
Jackson
Williamson
Saline
Gallatin
Union
Johnson
Pope
Hardin
Alexander
Pulaski
Massac
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On all our soil experiment fields in different sections of Illinois we are using fertilizer disk drills made by the Superior Drill Co., Springfield, Ohio. This implement not only applies two kinds of fertilizers at once, but it applies each of them at any rate desired and with perfect uniformity; and, at the same time, it cultivates the soil by disking. It enables the farmer to use raw materials instead of ready mixed fertilizers and thus saves the cost of mixing by the fertilizer manufacturer, which usually amounts from $4 to $8 per ton. If only one element of plant food needs to be applied, as is usually the case, the grain box may be used at the same time, (as in sowing wheat or oats), and, of course, grass or clover seed may be sowed through the grass seeder attachment if desired. Somewhat similar implements are manufactured by other companies. The end-gate feeder is also very satisfactory.

Table 3 shows the results of experiments which have been conducted by the Ohio experiment station and the Maryland experiment station, with several different forms of phosphorus which I believe could profitably be used on some Illinois soils.

TABLE 3 (a).—OHIO SOIL EXPERIMENTS.

AVERAGE OF RESULTS FROM WOOSTER AND STRONGSVILLE FIELDS.

Increase only—bushels per acre.

Plot No.	Form of Phosphorus (with Nitrogen and Potassium).	Crop grown.	1st year—increase.	2d year—increase.	3d year—increase.
28	Bone meal	Corn	2.42	4.16	6.46
29	Slag phosphate	Corn	3.51	9.32	13.19
30	Tankage	Corn	3.89	14.44	10.38
	Average		3.27	9.31	10.01
28	Bone meal	Oats	6.44	9.45	14.57
29	Slag phosphate	Oats	5.74	7.98	18.67
30	Tankage	Oats	3.71	7.12	10.98
	Average		5.29	8.18	14.73
28	Bone meal	Wheat	1.11	8.24	8.05
29	Slag phosphate	Wheat	2.21	11.32	8.43
30	Tankage	Wheat	.66	9.94	4.69
	Average		1.33	9.84	7.06

(b).—MARYLAND SOIL EXPERIMENTS.

Increase only—bushels per acre.

Plot No.	Form of Phosphorus (with Legume and Potassium).	Increase—Corn.			Wheat—1899
		1895	1896	1897	
8	Raw bone meal	1.6	4.4	12.5	13.8
9	Slag phosphate	1.0	3.5	9.0	14.1
11	Ground S. C. rock phosphate	3.0	6.2	11.3	9.1
12	Florida soft rock phosphate	4.6	7.7	13.7	10.1
	Average	1.3	5.5	11.6	11.8

The soil experiments carried on during the past 12 years by the Ohio experiment station, under the management of Director C. E. Thorne, are probably the most valuable series of soil investigations by plot experiments which have been conducted in America. In my judgment the value of these experiments to American agriculture is second only to that of the original and world-renowned investigations of Laws and Gilbert, which have been in progress during the past 60 years at Rothamsted, England. The Ohio experiments are of especial value to Illinois agriculture, because they have been conducted on soils which in many respects are similar to Illinois soils.

All of the experiments reported in Table 3 show that the full effect of these fertilizers is not produced till the second or third year, and the limit of increase may even then be due to an insufficient supply of nitrogen. In the Ohio experiments a five-year rotation of corn, oats, wheat, clover and timothy was practiced, and 75 pounds of commercial nitrogen were added; but other experiments in the series (not shown here) prove that still heavier applications of nitrogen further increased the yield, thus indicating that a more liberal use could well have been made of leguminous crops or farm manure. In the Maryland experiments the entire supply of nitrogen, aside from the nitrogen in the soil, was furnished by crimson clover grown in the corn as a "catch" or companion crop; and it is not improbable that the applications of phosphorus would have produced a much larger increase if a more abundant supply of nitrogen had been provided.

After ten years of investigations, Director Thorne reports that slag phosphate gives better results on Ohio soils than any acidulated phosphate. Untreated rock phosphate was not used in the regular series of Ohio experiments, but it has been used for a shorter time in connection with farm manure, and as stated above, its use has increased the value of the farm manure 30 per cent after paying the total cost of the rock phosphate. It is certainly of much interest to observe that in the Maryland experiments the effect of the untreated rock phosphate from South Carolina and from Florida compared very favorably with that of the slag phosphate. About 500 pounds of ground rock phosphate per acre were applied each year.

All of these experiments strongly indicate that fine ground rock phosphate, as well as bone meal, will be a valuable form of phosphorus for Illinois soils.

We already have soil experiments in progress in Illinois to determine positively the value of the different forms of lime and of phosphorus on different soils in the State, but you will bear in mind that it is only 20 months since the first appropriation was made for investigating the soils of this State and, of course, our results from field experiments are very meager.

Table 4 is believed to show approximately the composition of the principal types of soil in each of the different large soil areas in the State, as shown in the accompanying general survey soil map of Illinois, and briefly described on the following pages.

It should be understood that the divisions shown on the map are not soil types but soil areas, based largely upon the original formation of the soil, and that the composition given and the description and discussion which follow apply only to the principal type of soil found in each area. (In the detail soil survey which has already been begun by the Illinois Experiment Station, with the coöperation of the United States government, every type of soil, even down to ten-acre fields, is being mapped and analyzed.)

EXPLANATION OF MAP.

According to the geological investigation there have been three different times when glaciers, or ice sheets, have covered more or less of the State of Illinois, in consequence of which nearly all of the surface of the State is covered by soils of glacial formation. The first glacier covered all of Illinois as far south as the Ozark Spurs, excepting a part of what is now called Calhoun county and a small area in the northwest corner of the State. The area where the drift, or debris, left from this first glacier still remains the surface is called the Illinoisan Glaciation. For our purpose in soil investigation

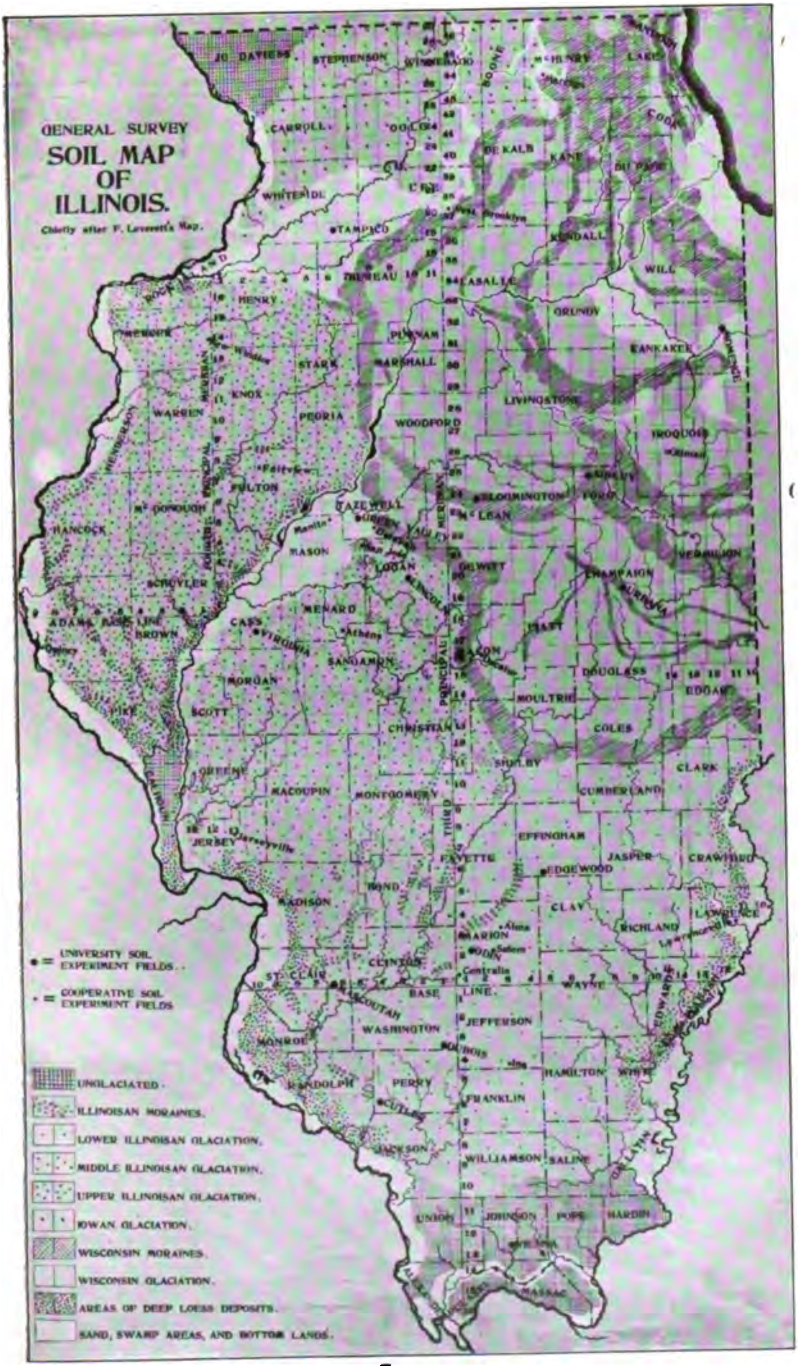

Plate I.—From Leverett's Glacial Map of Illinois.

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we divide this Illinoisan Glaciation into three areas, because of the marked difference in the agricultural values and properties of the soil. These three areas we call the Lower Illinoisan Glaciation, the Middle Illinoisan Glaciation and the Upper Illinoisan Glaciation, each of which will be more fully described later.

The second glacier covered only three or four tiers of counties from the north line of the State, but the area did not include the extreme northwest corner of the State. Where the drift from this second glacier is now the surface, it is termed the Iowan Glaciation.

The third and last glacier covered approximately the northeast one-quarter part of the State and this area is called the Wisconsin Glaciation.

According to the formation we have a number of very large soil areas in the State, although each of these areas may contain several different types of soil:

1. Unglaciated Area—Chiefly in seven southern counties.

2. Illinoisan Moraines—Chiefly ridges near Kaskaskia river.

3. Lower Illinoisan Glaciation—Chiefly between Wabash and Kaskaskia rivers.

4. Middle Illinoisan Glaciation—Chiefly between Kaskaskia and Illinois rivers.

5. Upper Illinoisan Glaciation—Chiefly between Illinois and Mississippi rivers.

6 and 7. Iowan Glaciation—(early and late)—Chiefly in Stephenson, Winnebago, Boone, Carroll and Ogle counties.

8. Loess Soils—Chiefly narrow strips of upland (five to 15 miles wide) along Mississippi, Illinois and Wabash rivers.

9 and 10. Wisconsin Moraines—(early and late)—Chiefly broad ridges and rolling prairie in northeast quarter part of the State.
11 and 12. Wisconsin Glaciation—(early and late)—Chiefly level prairie in northeast quarter part of the State.

13 and 14. Sand, swamp areas and bottom lands, scattered over the State.

TABLE 4.—FERTILITY IN ILLINOIS SURFACE SOILS.

Pounds per acre—tentative data.

Principal Type of Soil in the Area.	Nitrogen in 7 inches...	Phosphorus in 7 inches...	Potassium in 7 inches...	Lime required in 15 inches..
Unglaciated hills	1,000	1,000	5,600	900
Lower Illinois glaciation prairie	2,800	600	4,200	2,400
Middle Illinois glaciation prairie	5,000	1,000	8,400	200
Upper Illinois glaciation prairie	5,400	1,400	5,600	150
Iowa glaciation prairie	4,300	1,100	7,400	800
Wisconsin moraine soil	5,000	1,200	7,400	200
Wisconsin glaciation prairie	6,300	1,600	8,800	....
Loess soil, old	1,800	800	5,600	200
Sand soil	1,100	300	2,400	300
Peaty soil	67,000	2,000	1,200	600
Average United States fertile soil	5,600	2,000	6,600	....
German fertile soil	6,000	2,000	4,000	....
Ohio soil, Strongsville, O	4,400	1,400	3,200	(?)

It should be stated that several of these averages are based upon the analyses of a very few samples of soil (which however are believed to be truly representative of the type.) Consequently these averages should be considered as tentative and subject to revision upon the accumulation of additional data. The data given for the "Average United States fertile soil" are the average of six averages each of which represents as nearly as can be ascertained the average composition of the fertile soils of a state. These six states include Colorado, North Dakota, Minnesota, Michigan, Ohio, and Massachusetts, and the general average here given really represents several hundred separate analyses. These figures are also tentative and subject to revision as more data accumulate regarding the composition of the normal fertile soils of America, but this average is probably the best American standard we now have as to what is, and should be, the composition of a soil which needs no fertilizer of any kind to enable it to produce maximum crops.

The data given for the "German fertile soil" were recently furnished by Professor F. Wohltmann, Director of the Institute for Soil and Plant Investigatione, connected with the Agricultural Academy of Bonn-Poppelsdorf, Germany. These numbers represent the standard which Professor Wohltmann has adopted for the composition of a soil which needs no fertilizer of any kind. It is interesting to observe that these two "standards" which were obtained from entirely separate and independent sources are so nearly alike. The amount of phosphorus is exactly the same in each "standard," and it is somewhat surprising that Professor Snyder reported several years ago this same amount for the average phosphorus content of 200 fertile soils of Minnesota.

Probably we cannot do better at the present time than to adopt the German standard and consider that a normal fertile soil should contain 6,000 pounds of nitrogen, 2,000 pounds of phosphorus, and 4,000 pounds of potassium per acre, in the surface soil to a depth of 7 inches. And certainly no lime should be required to a depth of 15 inches.

In adopting this standard we must also assume that the soil is good physical condition and that it is normal in other respects; namely, that with increasing depth, the nitrogen decreases rapidly, the phosphorus decreases slowly, and the potassium and lime slowly increase in amount, which are the actual conditions in nearly all normal soils. Furthermore, we should bear in mind, this "standard" applies more particularly to grasses and cereal grain crops. For legumes the soil need not furnish any nitrogen, if it is properly provided with phosphorus, lime, and suitable bacteria. On the other hand, for potatoes, root crops, fleshy fruits, etc., the potassium content should probably be much higher than that given in the "standard."

There are two methods by which we can obtain some idea of the possible productive capacity of soils from a knowledge of their composition: First, by estimating the amounts of plant food which are likely to become available to the crops each year and comparing these amounts with the amounts actually required for the production of crops. Second; by comparing the soil with some standard, or normal, fertile soil.

(1). By the first method we may assume, for example, that about 1 per cent of the total stock of phosphorus and potassium and 2 per cent of the nitrogen contained in the surface soil may become available for the use of plants each year. By pointing off two decimal places in Table 4, and multiplying the nitrogen by two, we then have the numbers which represent these percentages of plant food in the soils (See Table 5). If this assumption were correct then the black prairie soil of the Wisconsin Glaciation would give up 16 pounds of phosphorus, or as much as is contained in 94 bushels of corn; while the white clay soil of the Lower Illinoisan Glaciation would give up 6 pounds of phosphorus, or enough for 35 bushels of corn. Of course, this is at best only an approximation, but nevertheless it serves to illustrate with some degree of accuracy an absolute fact; namely, that, at the most, it is only a small percentage of the total stock of fertility that becomes available to crops during any one season. This percentage will certainly vary somewhat with the season and it will vary with different elements and with different soils, but it is altogether likely that the richer soils will yield a larger percentage of their large stock than the poorer soils will of their small stock. In other words, the soil of the Wisconsin Glaciation, instead of 16 pounds of phosphorus, may give up 18 or 20 pounds, while the soil of the Lower Illinoisan Glaciation instead of 6 pounds may give up only 4 or 5 pounds of phosphorus.

TABLE 5.—APPROXIMATE ANNUALLY AVAILABLE FERTILITY IN ILLINOIS SURFACE SOILS—ROUGHLY ESTIMATED.

Pounds per acre.

Principal Type of Soil in the Area.	Nitrogen in 7 inches.	Phosphorus in 7 inches.	Potassium in 7 inches.
Unglaciated hills	20	10	56
Lower Illinois glaciation prairie	56	6	42
Middle Illinois glaciation prairie	100	10	84
Upper Illinois glaciation prairie	108	14	56
Iowa glaciation prairie	86	11	74
Wisconsin moraine soil	100	12	74
Wisconsin glaciation prairie	124	16	88
Loess soil, old	86	8	56
Sand soil	22	3	24
Peaty soil	*1,840	20	12
Average United States fertile soil	112	20	66
German fertile soil	120	20	40
Ohio soil, Strongsville, O	88	14	32
Contained in 100 bushels of corn	100	17	19

*Peaty soils decompose very slowly, consequently a very much smaller amount of nitrogen would become available than is here indicated.

In trying to study and to understand the subject of soil fertility and the meaning of soil analyses, it is exceedingly useful and helpful to fix in mind the fact that only a small percentage of the total stock of fertility contained in the soil ever becomes available to plants during any one season. As a general average, 1 per cent is perhaps approximately correct for phosphorus and potassium, while probably 2 per cent is more nearly correct for nitrogen.

Of course we should bear in mind that there is plant food in the subsoil, but its percentage of availability is very much lower than that of the plowed soil, and in many cases, especially with shallow rooting annual plants and cultivated crops, this additional supply of plant food is doubtless fully counterbalanced by losses of plant food in drainage and surface washing.

(2). By comparing the composition of the different soils in Illinois with that of the standard fertile soils it appears that the peaty swamp soils are the only soils of the State which do not need to grow leguminous crops to maintain their supply of nitrogen, and many of the soils are markedly deficient in nitrogen. As a rule, the soils which most need to grow legumes are markedly acid, and must be given an application of lime before legumes can be expected to be very successful upon them.

Perhaps the most striking fact is that none of the soils are very rich in phosphorus, while many of them are considerably below the standard fertile soil, and two or three soils of large area are markedly deficient in that element, particularly the large area of so-called white clay soil of the Lower Illinoisan Glaciation.

With the exception of the peaty swamp soil and the sand land, all of the soils of the State are above the German standard in potassium, although the soil of the Lower Illinois Glaciation is but little above it, and is not equal to the American average. It seems not improbable that applications of potassium might prove profitable on this soil, especially for growing such crops as apples, potatoes, sugar beets or other crops which require large amounts of potassium; indeed, we have some evidence which strongly indicates that potassium may be profitably used even on the Wisconsin moraine soil when such crops are frequently or continuously grown on the same field.

Table 6 shows the results which have been obtained from the application of different elements of plant food to an Ohio soil, whose composition is shown in Table 4.

The composition of the Ohio soil (see Table 4) shows that it is as well supplied with phosphorus as any of the Illinois soils excepting the Wisconsin Glaciation prairie and the peaty soil, while it is poorer in both nitrogen and potassium than most Illinois soils.

The results of ten years' experiments show that phosphorus has been used on this Ohio soil with very large profit, while nitrogen and potassium have been applied at a marked financial loss in nearly every instance. As most of the Illinois soils are better supplied with nitrogen and potassium than the Ohio soil, it seems very sure that these elements should not be purchased for use on ordinary Illinois prairie soils, unless it may be that potassium could be used with some profit for special crops, such as referred to above; and, possibly, even for other crops on the Lower Illinoisan glaciation (see Table 8). In one instance potassium was found to yield some profit when used for potatoes on the Ohio soil.

TABLE 6.—SOIL EXPERIMENTS AT STRONGSVILLE, OHIO.

Average of ten years. (L—lime; N—nitrogen; P—phosphorus; K—potassium.)

Plot No.	Plant food applied....	Cost of Fertilizer in 5 years.				Value of increase...	Net profit...	Net loss...
		N	P	K	Total.			
5	N	$11 25	....	....	$11 25	$ 0 93	....	$10 32
2	P	....	$2 40	....	2 40	12 54	$10 14	....
3	K	....	....	$6 60	6 60	45	....	6 15
6	NP	11 25	2 40	....	13 65	16 76	3 11	....
9	NK	11 25	....	6 60	17 85	3 23	....	14 62
8	PK	....	2 40	6 60	9 00	12 13	3 13	....
11	NPK	11 25	2 40	6 60	20 25	19 09	....	1 16
*29	LNPK	11 25	2 40	6 60	20 25	21 56	1 31	....

Cost per Pound.		Actual Value of Elements per Pound—Cents.				
Element.	Cents.	Alone.	After N.	After P.	After K.	After 2 others.
Nitrogen......................	15	1.2	....	5.6	3.7	9.1
Phosphorus	12	62.7	79.2	....	58.4	79.3
Potassium.....................	6	.4	2.1	.4	....	2.1
P. in 29*	12	....	....	....	....	91.7

*In plot 29 the phosphorus was applied as slag phosphate, and its higher value on this plot is undoubtedly due to the lime contained in the slag.

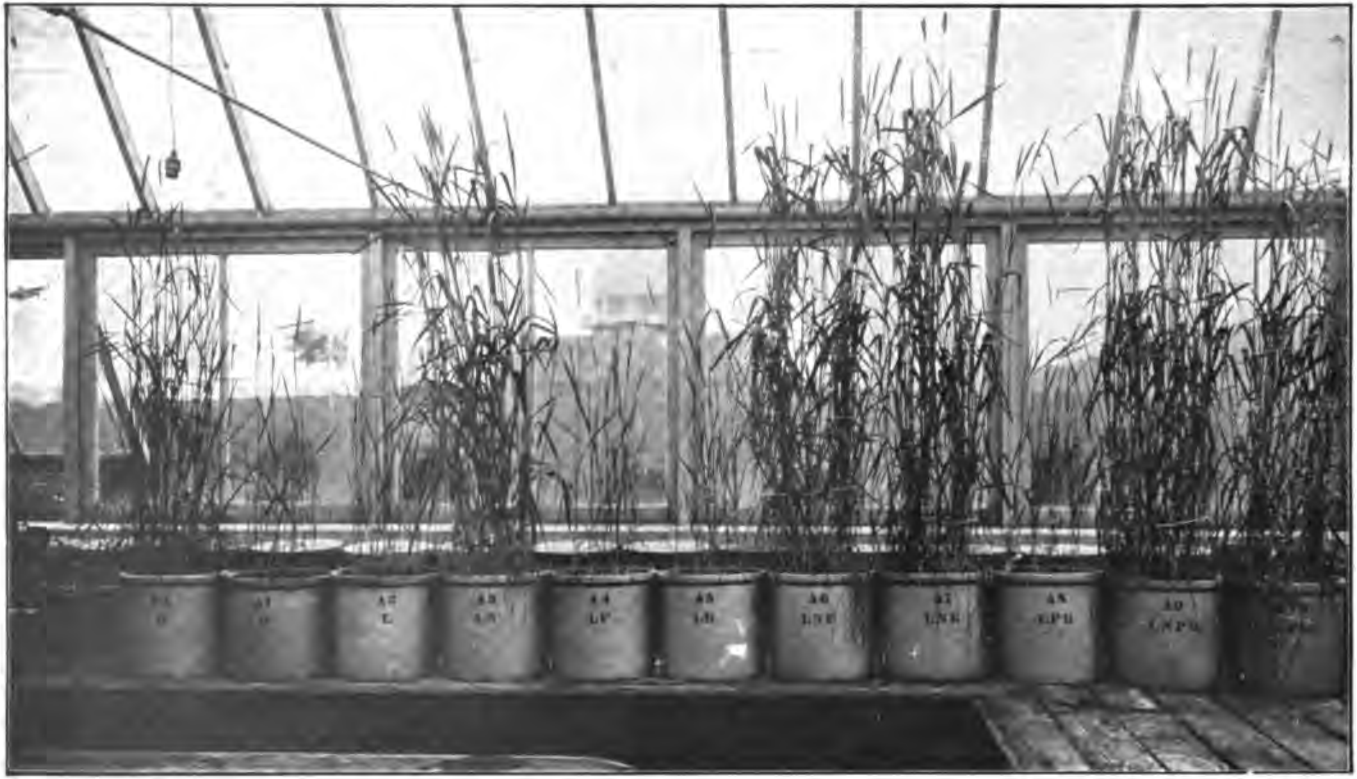

PLATE 2.—Wheat on Unglaciated Soil (Pulaski County Hills). Effect of Nitrogen.

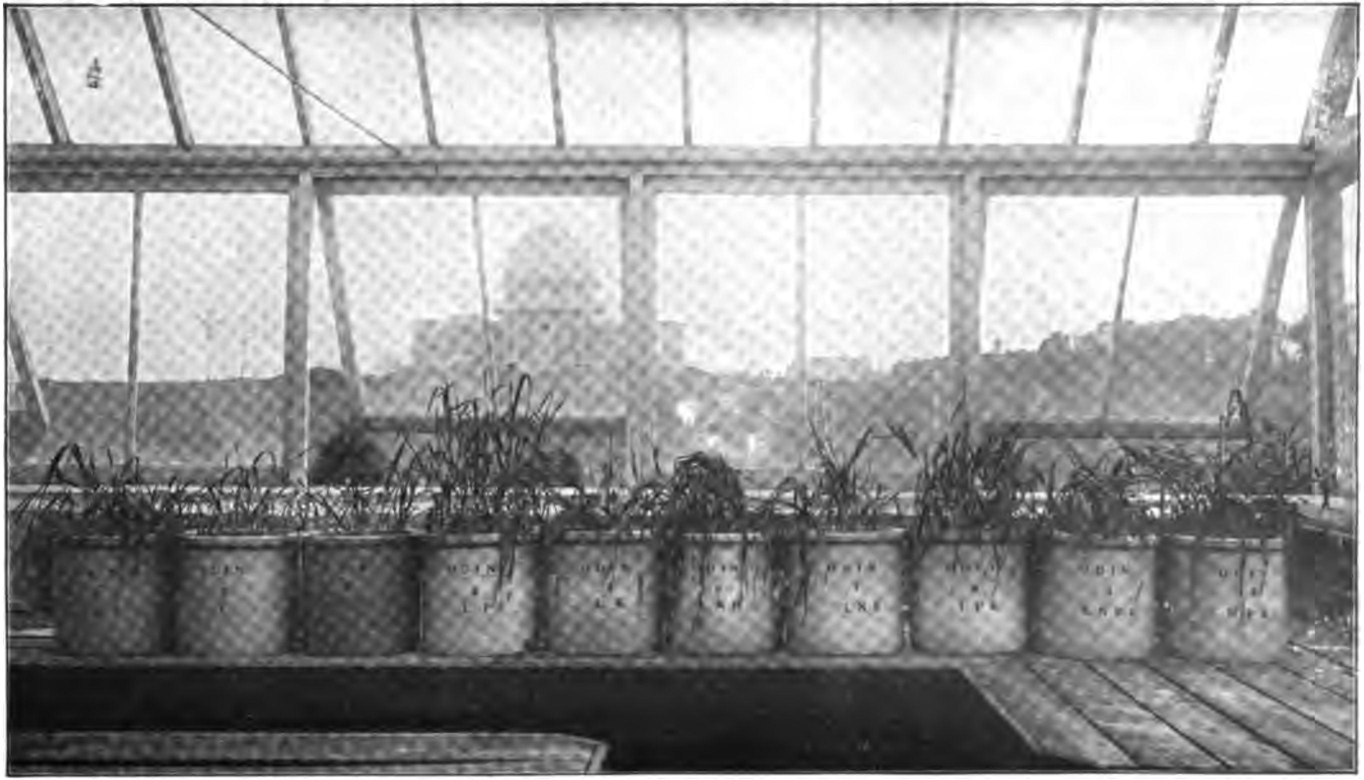

PLATE 2.—Wheat on Lower Illinoisan Glaciation Soil (Marion County Prairies). Effect of Phosphorus.

On the other hand, if applications of phosphorus are profitable on the Ohio soil, it would seem certain that they would be even more profitable on many Illinois soils, especially those which are markedly deficient in phosphorus, but which are well stocked with potassium, and either do have or could have abundant supplies of nitrogen if proper use were made of lime and legumes or farm manure.

Table 7 gives some results from pot culture and field experiments, which show (a) the value of nitrogen first, and then of phosphorus, on the old unglaciated hill soil of southern Illinois, Pulaski county (see Plate 2); also (b) the value of phosphorus first, then of nitrogen, and then of potassium on the lower Illinoisan glaciation, Marion county (see Plate 3); and, lastly (c), the marked value of potassium on the peaty swamp soil, Whiteside county (see Plate 4). By reference to Tables 4 and 5 it will be seen that these results are in accordance with what might be expected from the composition of these soils. (As a matter of fact, the nitrogen content of the unglaciated hill soil which was actually used in these experiments was lower than the average for that soil, which is shown in Table 4, while the phosphorus in the soil used was above the average.)

TABLE 7.—CROP YIELDS IN SOIL EXPERIMENTS.

Soil test No.	Kind of plant food applied.	*Unglaciated hill soil. (N most needed.)	†Lower Illinoisan glaciation. (P most needed.)	‡ Peaty swamp soil, Whiteside county. (K most needed.)	
		Wheat—grams.	Wheat—grams.	Ear corn—bushels.	Fodder—pounds.
1	....	3.0	11.0	....	1,000
1	L	3.9	11.6	....	800
3	LN	26.0	9.2	....	1,200
4	LP	3.3	13.6	....	2,000
5	LK	3.3	10.3	36.3	3,600
6	LNP	34.0	20.6	....	1,400
7	LNK	32.8	7.2	40.0	3,500
8	LPK	3.1	13.7	37.5	3,100
9	LNPK	34.4	26.5	60.0	4,400
10	NPK	30.6	24.5	52.5	4,750
11	....	3.0	9.9	....	....
12	....	3.4	9.5	....	....

* Compare 8 and 9 for maximum effect of nitrogen.
† Compare 7 and 9 for maximum effect of phosphorus.
‡ Compare 6 and 9 for maximum effect of potassium.

Table 8 shows (*) that in field experiments on the soil of lower Illinoisan glaciation (Perry county) phosphorus increased the yield of wheat from 13.1 to 16.5 bushels per acre, while the addition of potassium further increased the yield to 20.3 bushels; (†) that on the soil of the middle Illinoisan glaciation (St. Clair county) phosphorus increased the yield of wheat from 17.1 to 26.4 bushels, while with potassium added to the phosphorus the yield was still further increased to 33.8 bushels, as the average of three quite discordant results; and (‡) that on the Wisconsin moraine soil on the Experiment Station farm at Urbana (Champaign county) applications of lime, of both lime and phosphorus, and of lime, phosphorus and potassium, altogether, produced very beneficial and profitable results. The phosphorus was applied in the form of bone meal, at the rate of 320 pounds per acre. Potassium chlorid was applied at the rate of about 160 pounds per acre (a double application of potash salt was given to the sugar beets on plots 8, 9 and 10). It should be stated that two crops of sugar beets had been produced on this field previous to 1892. No fertilizers had ever been applied to any of these plots before the fall of 1901. The average of three years' previous corn crops is given in the last column, and shows that these plots were exceedingly uniform in their productive capacity previous to the application of fertilizers for the 1902 crop.

TABLE 8.—CROP YIELDS IN SOIL EXPERIMENTS.

Soil test No.	Kind of plant food applied for 1902.	* Lower Illinoisan glaciation.	† Middle Illinoisan glaciation.	‡ Wisconsin moraine.	
		Wheat, bushels—1902.	Wheat, bushels—1902.	Sugar beets, tons—1902.	Corn, bushels—average of 3 years.
1	....	12.8	19.7	9.23	66.8
2	....	12.4	15.2	7.80	67.0
3	....	12.4	15.3	9.53	66.3
	Average	12.5	16.7	8.86	66.7
4	L	13.3	17.7	13.14	71.8
5	L	12.9	16.5	14.53	71.7
	Average	13.1	17.1	13.83	71.8
6	LP	16.9	24.7	17.21	68.0
7	LP	16.1	28.0	18.22	67.4
	Average	16.5	26.4	17.72	67.7
8	LPK	20.8	29.8	21.83	68.7
9	LPK	19.4	31.7	24.08	67.4
10	LPK	20.8	30.8	23.86	64.7
	Average	20.3	30.8	23.25	66.9

† The particular soil used for this series of experiments was found to contain much less potassium than is contained in the average soil of this type; that is, the middle Illinoisan glaciation prairie.

NOTE.—These experiments will ultimately include the growing of leguminous catch crops (on plots 2, 4, 6 and 8,) and the application of farm manure about once in four years (on plots 3, 5, 7 and 9), and the effect of this additional treatment will be ascertained from subsequent crop yields.

The sugar beets were worth about $4.60 a ton and the total cost of the fertilizers on plots 8, 9 and 10 were about $12 per acre. Of course, legumes and manure are to be used on some of these plots in connection with the use of the mineral elements of plant food and probably we shall have more marked results after one or two crop rotations.

Lime is not expected to be of much direct benefit to wheat, but it should benefit legumes.

TENTATIVE RECOMMENDATIONS AND SUGGESTIONS FOR DIFFERENT TYPES OF SOIL, REPRESENTING LARGE AREAS OF ILLINOIS LANDS.

The following kinds of treatment recommended. or suggested for trial, for the soils of Illinois, are, as a rule, to be considered in addition to the use of the manure produced on the farm. I certainly ask for some measure of charity from Illinois farmers in their considerations of the recommendations which are here made for maintaining and increasing the productive capacity of Illinois soils. I am sure you will appreciate the fact that to investigate the soils of a state like Illinois is a task of no small magnitude. Bear in mind, for example, that the northern boundaries of Illinois almost coincides with the southern boundary of Vermont and New Hampshire, while the southern point in Illinois is only 30 miles north of the southern boundary of Virginia. Boston, Mass., and Richmond, Va., both fall within the latitude of the State of Illinois. This range of latitude includes Massachusetts, New Jersey, Delaware, Maryland and Virginia.

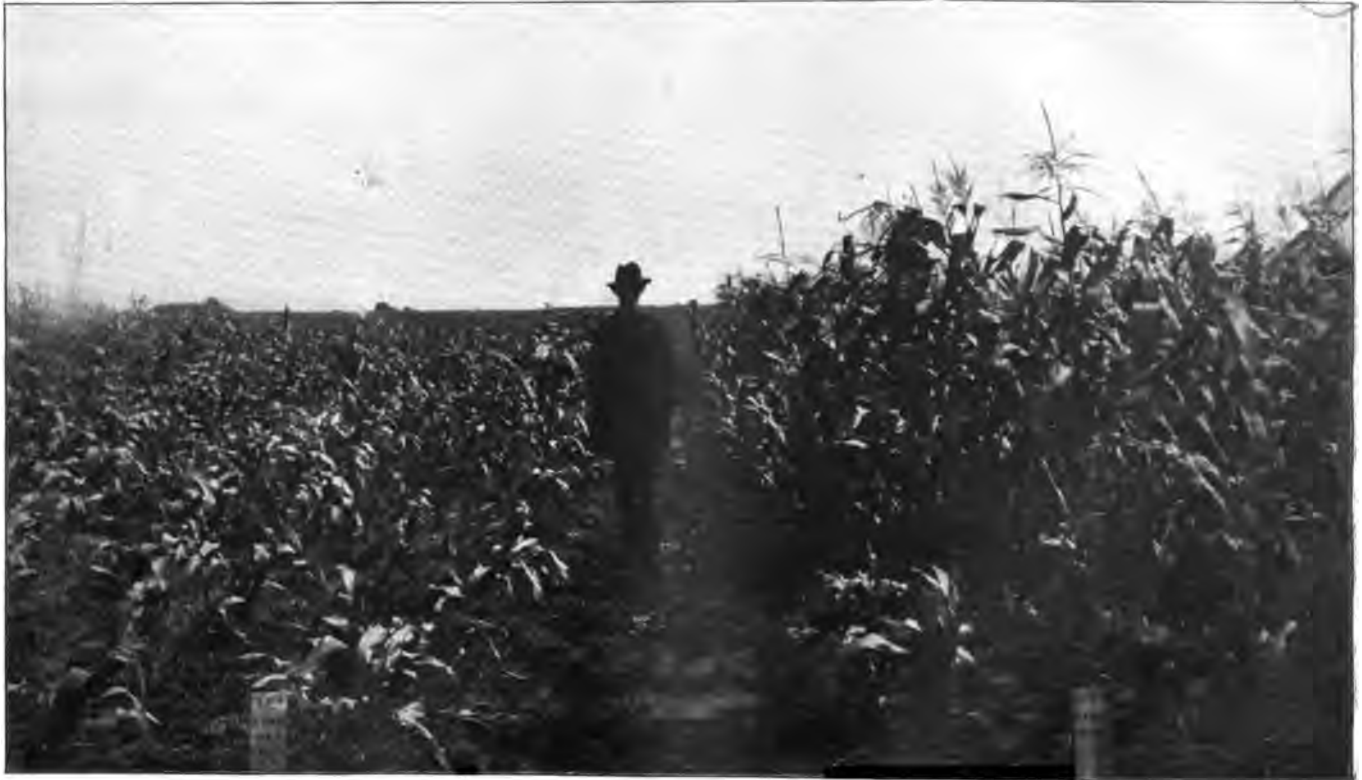

PLATE 4.—Corn on Swamp Soil (Whiteside County "Poison" Land). Effect of Potassium.

You will also bear in mind that less than two years have elapsed since these investigations began. We certainly realize that, as yet, our information is meager; our results are few; and the conclusions drawn are tentative. They apply more strongly to old worn soil than to new lands. These recommendations and suggestions are made with the hope that they may be given careful trials at least on a few acres of land and for at least five years, and the results compared with control or check plots which are treated in the ordinary way. In making these trials don't try to compare clover with lime, but compare clover with lime *and* clover both together; and don't compare manure with bone meal, but compare manure with manure *and* bone meal both together. For use in traveling you will not compare a horse with a carriage, but you will compare a horse with a horse *and* carriage.

While the recommendations as to treatment are very general, it is believed that when supplemented by good sense and general knowledge, more than one-half the farmers of Illinois can get some ideas or suggestions which they will be able to see are applicable to the actual soils they are cultivating. Nearly every farmer recognizes different types of soil, and, as a rule, farmers know which is the principal or commonest type of soil in their section of the State, whether they live in Johnson, Clay, Sangamon, Warren, Stephenson, McHenry, or Douglas county, or in any oher county in any of the large soil areas of the State.

All of the recommendations are meant only to supplement good farm practice. Always make use of farm manures, grow clover or other legumes, prepare the ground well, plant good seed, and practice good cultivation; but in addition to all of this, try the effect of applying lime, phosphorus, or potassium, in accordance with the composition of your type soil and the needs of the crop (See Table 1). Where a liberal use of leguminous crops is recommended, sow cow peas or soy beans or vetch in the corn at the last cultivation; sow clover or vetch in the oats and wheat or sow cow peas, soy beans, or vetch as soon as possible after the oats and wheat are harvested. In addition to this a full crop of legumes should be grown once in about three to five years.

UNGLACIATED SOIL.

Principal type: Red clay hill soil, common in the following counties: Union, Johnson, Pope, Hardin, Alexander, Pulaski and Massac.

Treatment recommedded: 1,500 to 2,000 pounds of limestone per acre and a liberal use of leguminous crops, catch and cover crops and in rotations. Additional treatment suggested for trial; 200 pounds bone meal (or 500 pounds rock phosphate*) per annum.

ILLINOISAN MORAINES.

(Not yet investigated.)

LOWER ILLINOISAN GLACIATION.

Principal type: "White clay," prairie soil, common in the following counties: Fayette, Effingham, Jasper, Marion, Clay, Richland, Washington, Jefferson, Wayne, Perry, Franklin, Hamilton, and to some extent in nearly all adjoining counties.

Treatment recommended: One to two tons limestone per acre and then 200 pounds bone meal (or 500 pounds rock phosphate) per annum and a liberal use of leguminous crops as catch and cover crops and in rotations. Additional treatment suggested for trial: One hundred to 200 pounds potassium chlorid or potassium sulfate, especially for potatoes, root crops, and orchards.

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*Until we have more definite information on the subject, rock phosphate should not be substituted for bone meal, excepting, perhaps, on soils rich in organic matter, or in connection with a liberal use of leguminous green fertilizers or farm manure, or both.

MIDDLE ILLINOISAN GLACIATION.

Principal type: Brown prairie soil, common in the following counties: Cass, Menard, Logan, Scott, Morgan, Sangamon, Greene, and in parts of Macoupin, Jersey, St. Clair, Clinton, Bond, Montgomery, Christian and Macon.

Treatment recommended: 500 pounds limestone per acre, and then 200 pounds bone meal (or 500 pounds rock phosphate) per annum and a liberal use of legumes.

UPPER ILLINOISAN GLACIATION.

Principal type: Dark brown prairie soil, common in the following counties: Mercer, Henry, Stark, Warren, Knox, Peoria, Hancock, McDonough, Fulton, Schuyler, and in parts of Brown and Pike.

Treatment recommended: Liberal use of leguminous crops. Additional treatment suggested for trial: 500 pounds limestone, and then 200 pounds bone meal (or 500 pounds rock phosphate) per annum.

IOWAN GLACIATION.

Principal type: Brown rolling prairie soil, common in the following counties: Stephenson, Winnebago, Carroll, Ogle, and in parts of adjoining counties.

Treatment recommended: 500 pounds limestone per acre, and then 200 pounds bone meal (or 500 pounds rock phospate) per annum and a liberal use of legumes, as catch and cover crops and in rotations.

LOESS SOIL.

Principal type: Light brown rolling upland soil, containing some very fine sand, common along the Mississippi, Illinois and Wabash rivers, usually occupying a strip of upland five to ten miles wide.

Treatment recommended: 500 pounds limestone per acre, and then 200 pounds bone meal (or 500 pounds rock phosphate) per annum and a liberal use of legumes, as catch and cover crops and in crop rotations.

WISCONSIN MORAINES.

Principal type: Dark brown rolling prairie soil, common in the following counties: McHenry, Lake, DeKalb, Kane, Cook, Du Page, Will, Kendall, LaSalle, Livingstone, Ford, and in parts of Bureau, Marshall, Tazewell, McLean, DeWitt, Champaign, Vermillion, Macon, Shelby, Coles and Edgar.

Treatment recommended: 500 pounds limestone per acre, and then 200 pounds bone meal (or 500 pounds rock phosphate) per annum and a liberal use of legumes, as catch and cover crops and in rotations.

WISCONSIN GLACIATION PRAIRIE.

Principal type: Black level prairie soil, common in the following counties: DeKalb, Kane, Bureau, LaSalle, Kendall, Grundy, Will, Kankakee, Putnam, Marshall, Woodford, Livingston, Iroquois, Tazewell, McLean, DeWitt, Piatt, Champaign, Vermillion, Macon, Moultrie, Douglas, Coles, Edgar, and in parts of Ford, Du Page, Cook and Lake.

Treatment recommended: Legumes in crop rotations. Additional treatment suggested for trial: 200 pounds bone meal (or 500 pounds rock phosphate) per annum, and also, on old worn soil or slightly roiling land, 500 pounds limestone per acre.

SAND SOIL.

Common in parts of Whiteside, Lee, Henry, Tazewell and Macon counties, and in some bottom lands along the Mississippi river.

Treatment recommended: 200 pounds bone meal (or 500 pounds rock phosphate) per annum and a liberal use of barn yard manure. Additional treatment suggested for trial: 500 pounds limestone per acre, and then 100 pounds potassium chlorid per annum and a liberal use of legumes.

PEATY SWAMP SOILS.

Common in parts of McHenry, Kane, Whiteside, Lee, Henry, Bureau, Kankakee, Tazewell, Mason, and to some extent in many other northern counties.

Treatment suggested for trial: 50 to 100 pounds potassium chlorid per acre, with light dressings of farm manure, if found beneficial.

In conclusion I would say that nothing else—most emphatically nothing else—pertaining to the business of farming compares in importance with the subject of soil fertility, and yet there is probably no subject about which Illinois farmers have been more indifferent in the past. I believe in well bred and well fed stock; I believe in making, saving and using farm manures; I believe in good cultivation; I believe in growing the best varieties of crops; I believe in the improvement of crops—in the improvement of corn by breeding; I believe in increasing the protein of corn; but I know that you cannot make protein without nitrogen; I know that you cannot get nitrogen economically without legumes and bacteria; I know that you cannot get legumes successfully on acid soils; and I know that a soil which gives up only five pounds of phosphorus per annum cannot yield 100 bushels of corn.

Last season we planted some improved seed corn on good soil at the university and it yielded 90 bushels per acre; we planted exactly the same kind of corn on the white clay soil of the Lower Illinoisan Glaciation and it yielded less than 15 bushels per acre. This is not a difference in the variety; it is a difference in the fertility of the soil.

On the other hand, we have obtained some striking indications of the value of plant food for making crops. Nor example, where we applied $8 worth of plant food in St. Clair county, we got an increase of 16 bushels of wheat the first year; where we applied $12 worth of plant food on the university farm, we got an increase of 14 tons of sugar beets which were worth more than $60 for factory use, and which we sold for $42 for feed; where we applied $4 worth of plant food to the peaty swamp soil of Whiteside county, we got 36 bushels of corn for it the first year. Some of these results are striking and they may be extremes, and yet in no case have we reason to doubt their reliability. (The tabular statements show all of the variations in duplicate and triplicate results). The experiments are conducted with the sole desire to learn the truth, to obtain results which may be obtained on any scale by any Illinois farmer who may try to practice what the experiments preach. These experiments must be continued; the results must be verified or proven incorrect. It should be borne in mind, however, that our experiments include the use of legumens for increasing the nitrogen in the soil and that we have not yet had sufficient time to determine the effect of leguminous crops upon succeeding grain crops both with and without the addition of the other elements of plant food and with applications of manure, the above results having been obtained with the use of the mineral elements only.

One thing, however, we believe is settled; namely, that we have discovered, proven, and demonstrated, for all time, that alfalfa can be grown successfully on Illinois soil; that is, on soils which are not acid, which are not deficient in phosphorus, and which are inoculated or infected with the alfalfa bacteria (See Plate 5 and also Bulletin No. 76, "Alfalfa on Illinois Soil."), and these results are not considered as tentative; they are conclusive. There is no longer a question as to whether alfalfa can be grown in Illinois. The only question is, will you provide the proper conditions for it? Of our own field at the university (on Wisconsin moraine soil) less than $1 worth of lime made more than $10 increase per acre in the alfalfa hay, and $4 worth of phosphorus made an additional increase of $15 worth of hay, while the presence or absence of the alfalfa bacteria made the crop a success or a failure, respectively. Alfalfa is not grown at the university alone, but it is now growing successfully (on well infected soils free from acidity) in many different places in the State, and yielding from 6 to 10 tons per acre annually.

Regarding many things pertaining to Illinois soils I do not have absolute knowledge or sufficient results to justify fixed opinions, but I do have a tentative opinion that the possibilities of financial profit to be derived from the purchase of lime and phosphorus and their application and use in connection with leguminous crops and farm manures on very large areas of Illinois soils are not yet dreamed of by the owners of Illinois lands. There are cultivated soils in the State which contain in the plowed soil only $5 worth of phosphorus per acre, and the subsoil is no richer. That the productive capacity of these soils is limited by their low phosphorus content, is beyond question; that it could be doubled by doubling the phosphorus content, though not yet fully demonstrated, seems highly probable. That the average yield of corn on Illinois soils can be profitably increased from 37 bushels to 75 bushels per acre seems entirely possible. But what is needed? First, the careful use of farm manure, and, in addition to that, perhaps a ton or two of lime or limestone once in ten years, a generous use of phosphorus at a cost of a few cents per bushel of corn, and, ultimately, it may be, a cent or two more per bushel of corn for potassium, and then a liberal use of the element nitrogen which everywhere rests upon the surface of the earth in inexhaustible quantities. However well this may sound in theory and however feasible it may appear to be, we must bear in mind that it has not been fully proven or demonstrated: but if we can prove and demonstrate that the fertility of Illinois soil can be profitably increased and permanently maintained, then we shall accomplish a work the value of which almost passes computation and comprehension. And when I say "we," I mean every man who has assisted or is assisting in this great work. I mean Andrew S. Draper, the president of the University of Illinois whose intellect perceived the fact that "The wealth of Illinois is in her soil and her strength lies in its intelligent development." I mean Eugene Davenport, Dean of the College of Agriculture and Director of the Experiment Station, whose mind conceived the tremendous importance to Illinois Agriculture of the investigation and the preservation of Illinois soil, and to whom more than to any other one man credit is due that such investigations are now in progress; I mean the Illinois Farmers' Institute, the organization which now stands as a guardian over the soils of this State, and whose members asked for, and secured the initial appropriation for soil investigations; I mean the members of the Advisory Committee who serve the State without pay and give practical and valuable advice regarding these lines of work; I mean the progressive farmers with whom we are coöperating in different sections of the State, whose public spirit and whose patience and watchful care over experiments on their farms and whose kindly treatment of myself and my associates make the work a pleasure to us, and of greater value to the State; and last, but not least, I mean L. H. Smith and J. H. Pettit, J. G. Mosier and E. M. East, W. F. Pate and J. E. Readhimer, the trained and skilled analysts and the accurate field assistants who work long hours in the laboratories and in the fields and upon whose work depends the accuracy of every conclusion drawn regarding the fertility of Illinois soils and the effects of soil treatment.

But I must add one more word: If we do not prove conclusively that the fertility of all of the soils of Illinois cannot be maintained by the use of legumes and the manure made from Illinois crops alone, and if we do demonstrate absolutely that that the purchase of any element of plant food is necessary and profitable, then, whoever buys plant food for use on Illinois soil, let him not buy a tonic or a stimulant or a trivial amount of some highly manufactured and high priced so-called commercial fertilizer which shall only urge the soil to greater exhaustion and result in no permanent good, but let him buy liberal amounts of the real elements as near to the raw materials as possible, such as fine ground limestone from the immense natural deposits of our own State, and pure phosphates, such as bone meal (originally a farm product), or as fine ground rock phosphate from the very extensive phosphate

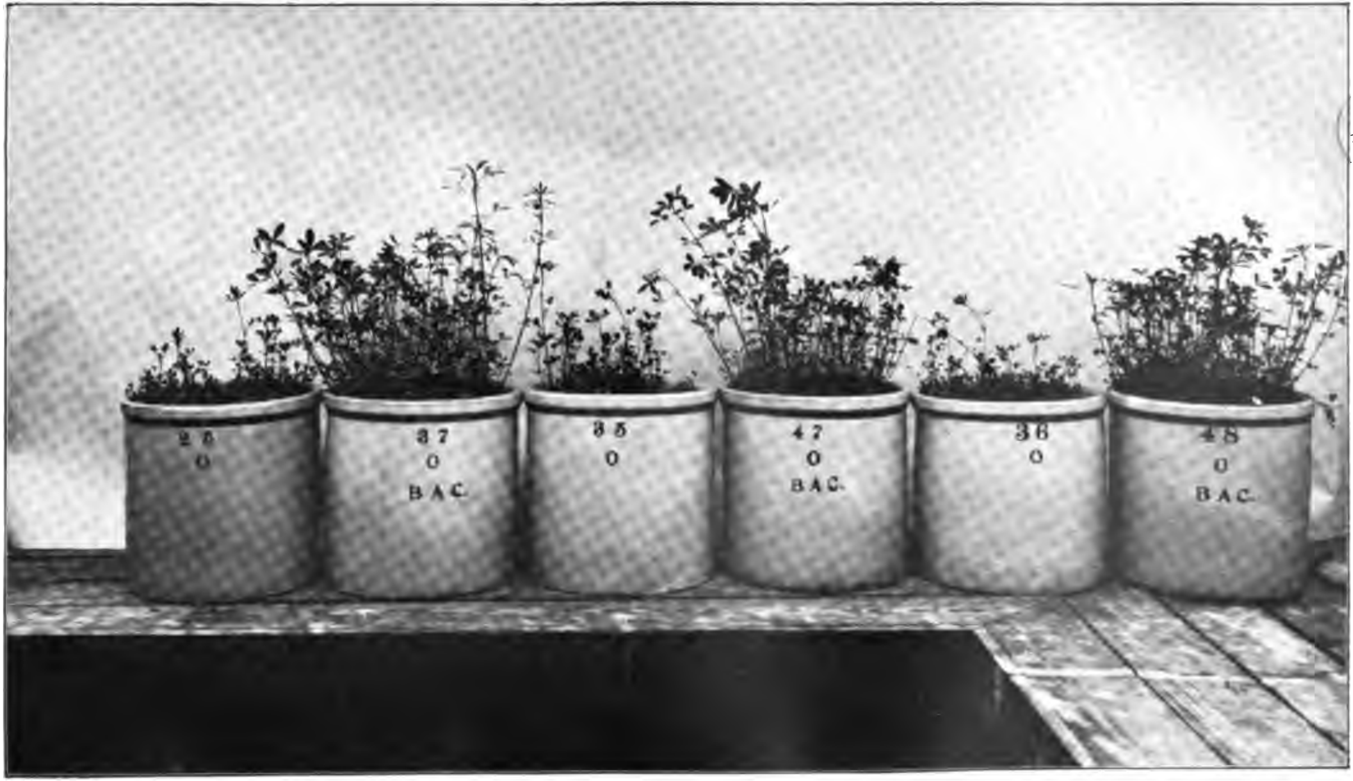

PLATE 15.—Alfalfa on Wisconsin Moraine Soil (Champaign County Rolling Prairie). Effect of Bacteria only.

mines of the southern states, and, if necessary, potassium from the abundant supplies of the German potash mines; and then let him apply at least two pounds for every pound he removes in crops; let the supply increase and not decrease; let the soils of Illinois not grow poorer, but richer and richer—for the land's sake, for your children's sake, and for Illinois' sake.

If we do learn that this is possible, then let us have one country on earth—let us have one State in the Union, whose soils shall not be ruined and whose children shall not be left with only a memory or a tradition of the bountiful harvests of former years.

Listen: One and one-half million tons of rock phosphate is the annual production of the mines of the United States.

Listen: One million tons of this material (two-thirds of the total product) is the annual export to foreign countries.

Americans are proud today that our exports exceed the imports. Are we proud of this export trade? If there is any one factor more potent than others to finally ruin the agriculture of this State—to reduce all our lands to the level of the worn-out land of the eastern states and of the countries of Europe, many of which cannot today produce their own supply of food—I say, if there is one thing which shall ultimately bring this condition upon us or upon our children, I believe it is the loss of phosphorus.

I am neither sensational nor merely theoretical. If anything I am practical. Pardon me for the personal remark. The greater part of my life I have been a practical farmer—not a "sidewalk" farmer, but a plain, every-day farmer in plain blue overalls—with hands which are still calloused from years of farm work.

Farm work! If working in the field from sunrise till sunset—plowing, sowing, planting, cultivating, harvesting, stacking, threshing—if this and the milking of 10 or 12 cows twice a day, besides other "chores," is farm work, then I have done farm work—not merely for a month or a season, but for years.

I do not speak of this boastingly. I speak of it because I want your confidence and the confidence of the Illinois farmers whom you represent. And I want your help and coöperation in trying to make Illinois farming something more than farm work. There was nothing in my farm work to be especially proud of, except, perhaps, my willingness to work. I did the work as my father and my father's father had done it. I worked hard, but I worked ignorantly.

I well remember that I worked just as hard and took as much pains to get a crop of 15 bushels of wheat from our land as Charles Cass, our neighbor only three miles from us, did to raise 30 bushels on some of his land. Why was the difference? We said he had better land. But why his land was better I did not know. I did not know that plant growth is absolutely dependent upon the presence of certain elements of plant food in the soil. I did not know that when the available supply of any one of these essential elements falls short then the crop must also inevitably fall short, no matter how hard I worked. As a matter of fact, I knew no more about the land than Lot knew four thousand years ago, when he parted from Abraham and chose to dwell "in the land of the plain of Jordan." Certainly I knew how to do farm work; I was well trained in most all farm operations, from digging out grubs and stumps in the timber land, or breaking the prairie sod with a four-horse team, to building a barn or granary, or stacking wheat or oats to shed the rain.

Nitrogen! phosphorus! potassium! available fertility! nitrifying and nitrogen-gathering bacteria! fixation of carbon! soil acidity!—Have those words anything to do with farming? If so, I did not know it. It seems to me that all I knew about farming was to work myself and to "rest" the land by rotating crops. And we rotated crops just as an Illinois farmer told me last summer he does. I asked him what crop he usually grew after wheat. He said, "That depends. If we get a fairly good crop of wheat, we usually grew wheat again." So did we. We grew wheat till the land grew tired, then we gave it a "rest" by growing corn or oats or timothy. Why clover would not grow we did not know.

But this I do know, that when my good father started me to an agricultural college he said, "Try to learn something about the soil"; and I know that when I began to study chemistry I said to my teacher, "Let me learn to analyze soils," and I fail to remember any more bitter disappointment than I had then when the professor said, "That is a hard thing to do; for to analyze the soil is one of the most difficult chemical analyses to make, and, furthermore, soil analysis doesn't seem to mean very much."

Nevertheless, I have learned to analyze soils, and to me soil analysis means very much.

Again I beg your pardon for these personal remarks.

But let me ask you, why are the people of Europe buying 1,000,000 tons of American rock phosphate each year? Are they ignorant and mistaken regarding its value; and is all the wisdom pertaining to agriculture science and practice locked up in the minds of the good, hardworking, honest men who run many of the farms of Illinois for $5 an acre cash rent or for one-half of all they can squeeze out of the soil?

Gentlemen of the Illinois State Farmers' Institute, my knowledge is small and my data few, but my opinion is that every ton of bone meal and every ton of rock phosphate annually produced in the United States could be used with marked profit upon the soils of Illinois, Indiana, and Ohio. I said with profit; but I also say, were there no marked profit in it, we should put back upon the soil at least as much phosphorus as we take off,—Yes we should put back as much as we have taken off during the past half century or more. But I believe that the purchase and intelligent use of phosphorus on many Illinois soils will ultimately pay a higher interest on the investment than the purchase of Illinois soils themselves, at present prices. When you buy land you do not expect it to pay back the principal the first year, neither should you expect it from heavy applications of plant food of which perhaps 90 per cent remains in the soil to benefit succeeding crops.

I do not advise farmers to rush into the purchase of phosphorus or other plant food on a large scale, but I do advise every land owner to lay off two uniform strips of land, about one acre each, through every important field, to take the exact yields of those two strips for a year or two, then to apply to one of these strips from year to year the treatment which from all the information obtainable he thinks ought to be given to it to insure the permanent maintenance or increase of its productive capacity; and then, if he finds it is profitable, or even if he can barely afford to do it, I advise him to apply this treatment to his whole farm, excepting only the untreated acre. which should always be reserved as a check to show what the soil would do without such treatment.

The Illinois State Farmers' Institute is the organization which first asked for an appropriation for the investigation of the soils of the State, and I trust the future generations will give you honor for it.

I now assume that the members of the Illinois State Farmers' Institute will be the leaders in applying and extending the knowledge which may be derived from these investigations, as rapidly as results may be secured and verified which shall be found practical for preserving the productive capacity of Illinois soils.

As I said in the beginning.

If the greatest study of mankind is man, the next greatest study is the soil; for, upon the soil, depends the preservation of man.

If it is true that American agriculture is the fundamental support of the American nation, it is equally true that soil fertility is the absolute support of American agriculture.

If he who makes two blades of grass grow where but one grew before is a public benefactor, then he who reduces the fertility of the soil so that but one ear of corn grows where two grew before is a public curse.

DISCUSSION OF PROF. HOPKINS' ADDRESS.

Q. Can the cow pea bacteria live on alfalfa bacteria?

A. No, sir; you must have alfalfa bacteria to live on alfalfa.

Mr. Coolidge—Do they gather any more nitrogen from the air than the plant needs for itself?

Mr. Hopkins—No, sir; but it makes its growth both above ground and in the roots, and when the crop is taken off the bacteria is left in the roots.

Q. How can you tell whether the soil is acid or not?

A. If clover grows luxuriantly on soil not exceedingly rich—not used as feed lots, etc.—if clover grows luxuriantly and you have no difficulty to know; but if clover is a failure—if it grows for a while and dies out, it is one of the best tests you have that the soil is acid and needs lime. The soils of Illinois are made from glacial drifts and contain granite and sandstone.

Q. What is the color of slag phosphate?

A. Dirty gray.

Q. What they use in Germany!

A. It is red there. That is the original rock phosphate, but the sample of slag from Pennsylvania is a dirty gray color. There is no phosphoric acid; it is phosphoric oxide—two atoms of phosphate and five atoms of oxide.

Q. How much would you put on an acre of ground?

A. I get to that a little later on.

Q. Would a ton be too much?

A. No, twenty tons would not be too much. There is no danger in putting on any quantity.

Q. How are you going to know the particular elements your soil needs?

A. It is the work of the experiment station.

Mr. Kellehar—Do you haul out any manure on the pastures down at Urbana?

A. We haul out all we get.

Q. I want to ask you what do you put on the land for clover? We have hauled out manure but we don't get any clover.

A. Undoubtedly what you should do is to put lime on that soil. Manure will make anything grow but it will not take the bateria from the air. We have grown clover in southern Illinois by adding nitrogen, but that is not the way to grow clover, We put the lime on and get it from the air then the bacteria will live if the soil is sweet.

Q. Does the supply of manure cut any figure?

A. Yes, sir.

Q. That is one application?

A. It is an average of ten years work.

Mr. Wallace—Why is it that Iowa farmers find that manure does magnificently and why is it that in Ireland where they have peat to burn they don't regard it of any value in furnishing nitrogen.

A. As a rule swamps are not supplied with bacteria. You may have it locked up in the soil but the nitrogen is not available to plants. Swamp soils do not have bacteria.

Mr. Wallace—Another question, where that peat soil gets the nitrogen, growing as it does from the moss that lives in the earth.

A. They are fed by the drainage water. The earth water contains a considerable amount of ammonia and the stagnant pools are fairly rich in nitrogen and I think it takes it from the water.

Mr. Wallace—What will these farmers have to do to be saved from buying commercial fertilizers?

A. They must know what they are getting.

Q. What must they do to be saved?

A. They must understand what they are getting. I am not objecting to using commercial fertilizers in the broad sense of plant foods if they know what they are getting, but using just fertilizers when they don't know what it is. Suppose your land needs potassium and you pay $15 for fertilizer you will pay about $11 for nitrogen, $3 for phosphates and $1 of it will give you a little dab of potassium. Get the fertilizing agent you need. Some of the fertilizers contain 12 and 13 different items.

Q. What amount do you put on to get results?

A. I would say if you use 400 pounds to the acre the first year, and afterwards twice as much as you would take off in a maximum cro. It takes 16 pounds to make 100 bushels of corn and I would say put on twice as much as you expect to take off.

Mr. Hopkins—Just one thing I have made some calculations as to money returned and I want to say that it is my deliberate opinion that the income derived from the work of the experiments will support and pay all the State taxes. I will be quoted as making that statement here.

WEDNESDAY AFTERNOON SESSION—1:30 O'CLOCK.

Mr. Easterly in the chair.

Music, instrumental, by Miss Kershaw.

Chairman: Ohio has furnished more Presidents in the last score of years than any other state in the Union. We believe in our University at Champaign. We have the best talent to be found anywhere, but when we want our talent pricked a little we send over to Ohio for a Thorne—Mr. Charles E. Thorne.

LIVE STOCK AND FERTILITY.

The maintenance of the fertility of the soil transcends in importance all other problems relating to the existence of the human race; for while the source of supply of the greater portion of our food is to be found in the atmosphere, yet the control of the soil over food production is such as to justify the popular idea that our food comes wholly from the soil. Certain it is that if the fertility of the soil be diminished the supply of food produced upon it must also diminish, and that the rapidly increasing population of the earth must sooner or later feel the necessity of increasing the production of food in order to maintain existence.

From time immemorial farmers have observed the effect of the manure of animals in increasing the yield of crops, and their observations have been recorded in the earliest writings in which allusion is made to agricultural operations. Probably the most striking illustration of this effect which the agriculture of the world is able to furnish may be found in the history of wheat production in England.

Fleta, an old English chronicle of the latter part of the thirteenth century, gives the average yield of wheat in England at that time as 10 to 12 bushels per acre. At the end of the seventeenth century the average yield "on the well tilled and dressed acre" was 20 bushels, according to a writer of that period. In 1771 Arthur Young estimated the average yield at three quarters or 24 bushels, while the present average yield is estimated at 28 to 30 bushels. It seems, therefore, that there been an average increase in yield at the rate of about three bushels per century, the rate increasing during recent times.

This gain in productiveness must be ascribed almost wholly to three factors: 1, improved methods of tillage and drainage; 2, systematic rotation in crops, including the culture of leguminous plants, and 3, the early development and constant extension of the live stock industry of that country, with the consequent use of animal manure.

Undoubtedly the other factors I have mentioned have contributed in a very important degree toward increasing the yields of England's wheat fields, but these alone cannot offer a sufficient explanation of the remarkable outcome. Tillage, drainage and crop rotation are the necessary factors in the development of the natural fertility of the soil; but after these have accomplished their full effect production will come to a standstill, and then will begin to decrease, unless the original store of soil fertility is supplemented from other sources.

Even rotation with leguminous plants, fundamentally important though such rotation is to a successful agriculture, can actually add but one of several equally essential constituents to the store of soil fertility. For a time such plants may pump up phosphoric acid and potash from the lower strata of the soil and deposit them in the superficial layers, where they may be more readily accessible to the comparatively shallow rooting *gramineæ*, but after a time, longer or shorter, according to the depth of the soil, this transposition of fertility will lose its effect; clover will no longer grow luxuriantly as before, and the entire stock of fertility will have been reduced rather than augmented by its growth.

But the British farmer has from time immemorial been a keeper of live stock, and the chief part of the produce of his fields, except his wheat, has been systematically converted into meat. We Ohio farmers pride ourselves upon the fact that Ohio keeps more sheep to the square mile than any other state in the Union, and you Illinois farmers take a similar pride in your cattle; but while Ohio had, in 1900, 98 sheep to the square mile and Illinois had 57 cattle to the same area, there were enumerated 300 sheep and 77 cattle to the square mile in Great Britain, or three times as many sheep as Ohio had and one-third more cattle than Illinois possessed.

I do not forget that Great Britain is the fountain head from which streams of pure blood have flowed to improve the live stock of the world, but the exports for this purpose are a comparatively small fraction of the whole live-stock enumeration. The two great objects for which the average British farmer maintains his flocks and herds are the production of meat, for the greatest food market in the world, and the maintenance of the fertility of his soil.

Neither do I forget that the British farmer has become a large purchaser of the so-called commercial or chemical fertilizers; but the advance in wheat yield to which I have alluded was nearly all accomplished before the use of such fertilizers was discovered. And, in fact, these fertilizers came into use in Great Britain through the discovery of the remarkable effect of superphosphate upon the turnip crop, this being one of the great feeding crops of that country; so that they have been used largely, if not chiefly, to produce more food for live stock, and thus greater stores of manure—a practice directly opposite to that prevailing in Ohio, where such fertilizers are used almost exclusively on wheat.

The epoch making experiments of Lawes and Gilbert at Rothamsted, England, followed by the world wide extension of research in this direction through the agricultural experiment stations, which are now at work in practically every civilized country, show that a high and increasing rate of crop yield, especially wheat, may be maintained through the use of fertilizers; but this work also shows that yields are attained at a cost so great as always to cause a great reduction of the margin of profit, and often so great as to completely obliterate the margin.

In Broadbalk field of the Rothamsted experiments, where wheat has been grown continuously since 1852, an average yield of 36¾ bushels of wheat per acre has been produced for the 48 years ending with 1899, from an annual application of 1,400 pounds of chemical fertilizers, which would cost in this country, at present market quotations, about $23 per acre. This yield was five pecks more than the average production from 14 tons of barnyard manure for the same period, while the average unfertilized yield was 13 bushels per acre, showing an average increase of a bushel of wheat for each dollar's worth of chemical fertilizer and a little more than a bushel and a half of wheat for each ton of manure.

These experiments show that wheat may be grown indefinitely on soil which receives no additions of humus except from the decaying roots of the wheat itself, provided the supply of the chemical constituents of fertility is maintained, and this is in accordance with the common experience of farmers, that wheat does best on soils containing but a moderate supply of humus.

With corn, however, the case is different. The best corn lands in the world are our mid-continent prairies, with their great depth of humus filled soil, and the larger the proportion of the humus, up to the point where the soil is converted into muck or peat, the more valuable is the soil for corn production. But of all plants grown in the temperate zones none produces so much food to the acre as does our corn, and hence the most valuable lands in the world are those upon which corn is at its best, so that you farmers of Illinois, who live in the heart of the great corn belt of the world, may well congratulate yourselves upon your heritage.

But to any Illinois farmer who is disposed to look upon his soil, as rich as it is, as a deposit from which he can draw indefinitely without making any return, I would utter a word of caution. Ohio, also, is a great corn state, one of the eight states—four on the east side of the Mississippi and four on the west—which produce about two-fifths of the corn grown in all the world, and I have many times heard the assertion that corn has been grown continuously on the rich bottom lands of the Scioto and Miami valleys for half or three-quarters of a century without any diminution in the yield.

Since 1850 the township assessors of Ohio have been required to collect statistics of crop production within the state. I have compiled these statistics for the wheat and corn crops for each of the 50 years, 1850 to 1899, and for each county in the state, and have averaged the results of this compilation by ten year periods, as shown in the table below:

AVERAGE YIELD OF WHEAT AND CORN PER ACRE IN OHIO.

Period.	Bushels per Acre.	
	Wheat.	Corn.
1850-59	12.29	33.43
1860-69	11.00	31.93
1870-79	13.23	36.52
1880-89	13.53	33.56
1890-99	14.65	33.18

This table shows a considerable increase in the yield of wheat during the half century under record, an increase, however, which the analysis of the results of sections shows to have been chiefly in the northern half of the state, and which may be largely accounted for by the use of commercial fertilizers over the northeastern quarter of the state, which has become common during the last 25 years, and by the drainage during the same period of the great, black plain covering the northwestern quarter.

In the case of the corn crop the table shows a large gain in yield during the 70s, as compared with the previous two decades, after which the yield has been steadily diminishing. Analyzing these figures also by sections, we find that the gain in corn yield has chiefly occurred in the northwestern part of the state, where it is fully accounted for by the immense drainage operations which transformed that region from the "Black Swamp" of the early history of the state into a veritable garden.

When we come to the river valley counties—not only the hilly counties along the Ohio, but comparatively level counties of the rich Scioto and Miami valleys, we find that there has been a conspicuous reduction in the yield of corn. This reduction cannot be accounted for by the bringing in of uplands, less responsive to the demands of the corn crop than the fertile bottom lands, for not only has there been a decrease in yield per acre in these counties since 1850, but there has also been a general decrease since 1870 in the area devoted to corn.

Let us now briefly review the agricultural history of Ohio during the half century under consideration. One of the earliest scenes hanging in the picture gallery of my memory is that of my father, leading a company of men who were reaping a field of tangled wheat with the sickle in one of the southwestern counties of Ohio—just such a scene as might have been witnessed in the field of Farmer Boaz 3,000 years before, except that no Ruth ever gleaned in an Ohio wheat field. The grain cradle, invented about 1830, was used in harvesting standing grain, but it could not be used in tangled grain. The flail was still occasionally used in threshing, and I have guided the team many a day which dragged the heavy "A" harrow, covering in the seed which my father sowed broad cast in front, and I have helped him haul the harvested grain many miles to market.

This was during the 50s. Two canals had been constructed across the state and two or three short lines of railroad had been built by the beginning of the decade, and these were rapidly followed by others; but up to this time the wheat was hauled to neighboring, water driven mills, or floated down the canals or rivers to southern markets, and 50 cents a bushel was the common price for it in the local markets. For corn there was no market as such, but it was converted into beef or port, and then driven to market on the hoof. Cincinnati became the great hog market of the world, while cattle were occasionally driven across the mountains to Philadelphia.

Under such conditions, and these conditions had prevailed since the first settlement of the state, the farmer's operations were adjusted to the number of his live stock, and his crops were grown chiefly to be fed to his animals.

Except in the river valleys, Ohio soils were never so fertile but that manure would make a distinct impression on them, and while the methods of handling manure were extremely crude and wasteful, yet a great deal was made and used.

Then came the war period, and the strongest of our young men dropped their implements of agriculture and shouldered the musket. Those left behind were stimulated by the fabulous war prices to extend their crops over the widest possible areas, and the diminished yield per acre shows lack of thoroughness in cultivation.

Next came the seventies: the returned soldiers were again at work and labor was comparatively abundant; prices were settling to the gold basis, but were still high enough to amply reward the farmer for his toil; railroads were rapidly extended over the state; the grain elevator made its appearance at the railway stations; agricultural machinery was being perfected, and the area devoted to corn and wheat was extended by a million and a half of acres—the greatest extension ever made in the state during a similar period.

But as the early fifties marked the transition from the old era of sickle and flail, which had prevailed since the days of Abraham, to the present age of substitution of sinews of steel for those of flesh, so the close of the seventies marked another agricultural revolution in the opening simultaneously of the great stock ranges of the mountain region and the development of the bonanza wheat farms of the northwest, a development made possible by the automatic wheat harvester, and by the beginning of the eighties cattle began pouring into the Chicago market from the ranges, and wheat from the Dakotas, and prices dropped to levels unheard of in a generation. Land values fell until farms which had changed hands at $80 to $100 per acre during the seventies were now sold by the sheriff at $40 to $60. Cattle were sold at what seemed to be less than the cost of production, as compared with previous prices, and few were bred to replace them, while at the same time the acreage in crops was reduced to such an extent that the end of the decade shows half a million acres less area in corn and wheat than the beginning.

In the accompanying diagram I have attempted to show the relative course of live stock and crop production in Ohio for the fifty years under review. In this diagram I have combined the number of cattle and sheep on the basis of the equivalence of one head of cattle to ten of sheep, a basis which is approximately correct for the class of sheep generally kept in Ohio.

From this diagram it will be observed that, starting in 1850 with the equivalent of a million and a half of cattle and a little more than three million acres of corn and wheat, we maintained about this ratio until 1870, when we had 2,000,000 cattle and 4,000,000 acres in corn and wheat. For 15 years following the number of live stock remained practically equivalent to 2,000,000 cattle; but from 1885 forward there was a rapid reduction, both in cattle and sheep, until the close of the century found our live stock enumeration just where it stood at the middle, although we had doubled our acreage of corn and wheat, raising it from 3,000,000 acres in 1850 to nearly 6,000,000 in 1899. Had we maintained the ratio which prevailed during the first two decades of this period, we should have had the equivalent of 3,000,000 cattle at the close, and then would have still had a smaller live stock population by more than 40 per cent than is found in Great Britain.

Wheat has always been looked upon as the cash crop in Ohio, and the automatic harvester made it possible to produce wheat with much less human labor than formerly; so, notwithstanding its low price, the area in wheat began to increase, and by the close of the century we had gained nearly 700,000 acres in wheat acreage, over the area devoted to this crop in 1870, as against an increase of only 137,000 acres in corn area. There was, in fact, a large reduction in corn area in the southern and southwestern parts of the state, where it had formerly been most largely grown, with a corresponding increase in the area devoted to wheat.

Not only was the corn acreage thus given over to wheat, but most of the manure from our greatly diminished flocks and herds was used for dressing the wheat. This was good for the wheat and good for the clover, when it was permitted to follow the wheat, and for the timothy which followed the clover; but when the corn came along, to take what little fertility the wheat, clover and two or three crops of timothy had left. it had poor picking indeed.

Too often the clover was left out of the rotation, for the hay baler had made its appearance at almost every railway station; the great cities were offering good prices for prime timothy hay, but strenuously objected to clover; so the hard-up farmer was constrained to make of timothy also another cash crop.

The result of all this has been a decrease in the yield of corn since 1870 in all quarters of the state and in almost every county, until the yield of the state as a whole now falls below that of any other period since the records have been kept, except the strenuous period of the sixties; and although there has been an apparent gain of 2⅓ bushels per acre in our wheat yield since 1850, it has nevertheless been accomplished at so large an expenditure for commercial fertilizers as to leave it open to question whether there has been any actual gain in the productiveness of our soil for 50 years.

The advent of these fertilizers was another of the factors which made their appearance in Ohio's agriculture during the transition period we are considering. The use of such fertilizers began during the later seventies, and by the close of the eighties they were in general use over the eastern half of the state. The farmer found it very much less labor to run a sackful of the so-called "phosphate" through his drill along with the wheat than to haul out a load of manure, and he found, too, that the effect of the phosphate was often more quickly apparent than that of the manure. The fertilizer agent now saw his opportunity; he traveled all over the state with his bottle of samples and recited his fabulous tales of their magical effect. He was always ready to wait for his pay until the crop should be produced—and well he might be, for his margin was more than ample. The result is that our fertilizer bills have run up to an average of more than a million and a half of dollars annually, about one-third of which we pay for being persuaded to buy.

Let me not be understood as condemning the use of fertilizers. On the contrary, I regard the utilization of the great deposits of phosphatic rock, of nitrate of soda, of potash salts and of the waste from our slaughter houses as one of the greatest steps in modern agricultural progress; but when blind, haphazard use of these materials takes the place of an intelligent study of the fundamental principles underlying agriculture, as it too often has done in Ohio, they become a curse instead of a blessing.

One of the reasons for the large effect produced by phosphatic fertilizers is the fact that barnyard manure is relatively deficient in phosphoric acid; and hence, when such fertilizers are used on lands which have had only animal manure before, unless the soil contains a large proportion of available phosphates, a very marked effect is likely to be produced. Not only is the manure originally deficient in phosphoric acid, but the more soluble, and therefore the more valuable portions, both of phosphoric acid and potash, are quickly leached away when exposed to rain in open yards, while the nitrogen, a constituent still more valuable than even the phosphoric acid and potash combined, is subject to excessive loss in the form of ammonia gas when the manure is left in heaps. The investigations of the Cornell Experiment Station upon this subject are most instructive; they leave little room to doubt that fully half, probably much more than half the potential fertility resulting from our live stock husbandry is needlessly wasted.

At the Ohio Experiment Station we have for five years conducted an experiment in the use of cow manure in the production of corn, wheat and clover grown in rotation. The result of this test is that in the five-year average we have produced and increase of about two bushels of corn, two-thirds of a bushel of wheat and about 60 pounds of clover hay for each ton of manure, when the manure has been taken from an ordinary, open barnyard; the total increase being worth $1.50, if we value corn at one-third of a dollar per bushel, wheat at two-thirds of a dollar, clover hay at one-third of a dollar per 100 pounds, corn stover at $3 per ton and straw at $2. When, however, we leave this manure in the stable to be trampled under foot until ready for use, the increase has been worth $2.50 per ton of manure; and when to this stall manure we have added as made about 40 pounds of phosphatic rock to each ton of manure, for the purpose not only of preventing the escape of ammonia but of re-enforcing the manure with phosphoric acid, we have realized a total net value of $3.25 per ton of manure, after paying for the phosphate used, the manure treated in this manner producing an average increase of 3 bushels of corn, 1¾ bushels of wheat and 125 pounds of hay for each ton of manure.

We now have 48 steer calves, weighing 470 pounds each, which have been fed for 40 days on a cemented floor, 7,345 pounds of bedding being given during that time. During this period there has accumulated 20 tons of such manure as that used in the experiment above described, or at the rate of a ton per animal in 100 days. The feed given these calves is costing 10 cents each per day, at the relatively high prices now prevailing. We are therefore recovering about one-third of the cost of the feed in the potential value of the manure.

These calves, it will be observed, are less than half grown, and the amount of manure removed is less than one-third what is usually estimated for a full grown cow. The Cornell and New Jersey stations have shown that such a cow will produce 12 to 14 tons of manure per annum. If, therefore, we assume that the average animal, taking all ages, will produce three tons of manure during the period of winter feeding, we shall be well within bounds. On such an assumption the million and half of cattle, which would be required to bring up Ohio's live stock population to the ratio which prevailed before 1870, would produce 4,500,000 tons of manure each winter, which, if properly saved and applied, should produce crops again to the value of more than $13,000,000 annually.

Let us compute this problem in another way: In 1900 we purchased in Ohio 150,000,000 pounds of commercial fertilizers, or 75,000 tons. If we assume that these fertilizers carried on the average 2 per cent each of nitrogen and potash and 12 per cent total phosphoric acid, we shall be considerably above their actual composition. This assumption would give us a total of 3,000,000 pounds each of nitrogen and potash and 18,000,000 pounds of phosphoric acid. But cow manure contains per ton an average of about ten pounds of nitrogen, six pounds of phosphoric acid and seven pounds of potash; hence the 4,500,000 tons of such manure that might be saved from 1,500,000 cattle during the six months of winter feeding would carry 45,000,000 pounds of nitrogen, 27,000,000 pounds of phosphoric acid and 31,000,000 pounds of potash, or 15 times, one and one-half times and ten times as much, respectively, as we purchased in fertilizers, for which we paid out, in hard cash, more than $1,500,000.

There is another phase of this question which I wish to put before you. I have alluded to the idea which seized our Ohio farmers during the eighties, that the prevailing prices for live stock did not cover the cost of production, and undoubtedly many animals did fail to pay for the food they had consumed; but a glance at the statistics of prices for cattle in the Chicago market over the years 1886 to 1900, inclusive, shows that there has not been a month during all that period when the best cattle were not sold above 4½ cents per pound, while the average price has been above five cents. Of course stockers, rough cattle and half-fed cattle have often been below these figures, but the best grades have always commanded a price in excess of 4½ cents.

Now, at our experiment station we have fed off, in different seasons, a total of 39 steers, of different breeds, taking them from the dams at a few days old and keeping a careful record in each case of the quantity of food consumed, including whole milk, skim milk, grain, hay and pasture, counting each article of food at its market price, and we find that the total food consumed by these steers has cost from 3¾ to 4⅛ cents per pound on their final live weight at Chicago or Pittsburg.

Of course there have been occasional bad markets during this period, when cattle went below the price named; but the farmer who held on to his live stock and managed it judiciously has received at least as much money for his crops as his neighbor who sold his grain at the elevator and passed his hay through the baler, and if the stockman used good judgment in the management of manure his fields are in a far better condition today than those of his grain selling neighbor.

In conclusion: The meat eaters rule the world today and will do so for an indefinite time to come.

As they extend their sway the demand for meat will increase, not only because of the improved condition of the stronger races but because of the influence of their example upon the weaker ones.

As the production of meat is found to be the most profitable branch of agriculture at the center of population of the dominant race, so it will be found in the ever widening circle of that race's influence.

By no other method yet known to man may the fertility of the soil be maintained so surely and at so low a cost as through the use of the incidental products of meat production.

Of all plants cultivated by man none is so well adapted to constitute the basal food for meat production as Indian corn.

In no other part of the world is this food plant grown to such perfection as here in the heart of the Mississippi valley. For this reason, as well as because of the rapid increase of great urban populations in this region, and the location here of the greatest meat markets of the world, must the production of meat constitute a leading feature of our agriculture.

Mr. Easterly—I will introduce one of your own home farmers to lead the discussion. Please be brief with your questions.

Mr. Kerrick—I was profoundly impressed with this paper, and the great and practical truths that were set forth there in such a practical and intelligent way. And the whole matter is so serious to me that I feel a good deal like I do at my church on Sunday morning after the minister has finished a good, telling, effective sermon. I don't feel like getting up to discuss it, and I never do. I am here more for the purpose of illustrating that this is open for discussion and to break the ice and induce more timid ones, but more able than I, to say something about this great subject.

There are many able men, experienced on this line, abler than I, and with wider experience, here, and surely I will take up but a few minutes of the time to myself.

Talking to Illinois people about exhausting their soil is just about as unsatisfactory as talking to a great robust, strong man, who never was sick a day in his life, about taking care of his health, but he would better take care of it just the same, and as rich as the prairie soils are, and as valuable, we can get the value out of it. And remember, my friends, the future of Illinois land is in their fertility. Land making $100 and $150 will make $200 and $250 land within the lifetime of middle aged people if we treat it right. It is the fertility that is doing it all.

I could go over into Ohio, where my friend Thorne lives. I think I could pick me out a hillside farm, with a spring and a mill on the stream, and find it pleasantly suited to a man of my poetical temperament and make up more than on the prairies of Illinois. Whenever our soil is exhausted this will not be the most desirable place to live. It is worth while to hammer this old subject over a deal, because, as I say, it is difficult to get serious attention to this subject.

The men who have lived on their farms all the time, that kind of men are not soil robbers, for the men who live on their farms generally keep cattle, and horses and hogs and sheep. The increased profit of farming, the farm life with its increased comfort and the combining of stock raising therewith is tending to keep the old men and the young men and the boys there, but those farms are not exhausting their fertility and this kind of talk does not appeal to them. The soil is so deep that the man who stays on it a short while and goes to town doesn't think he is being talked to when this question is discussed.

While we have been working the land the methods have been improved, we don't let the weeds grow, the implements have been improved. We have learned many things. We have improved the methods of getting the fertility out of the soil and in better methods of farming, and that stands in the way of meeting the great fact that we may after all exhaust the fertility, and I congratulate you and myself in having this matter put in figures covering a period of more than 50 years, furnishing facts that certainly cannot escape the most stubborn of us.

It may be the soil of Ohio can be more rapidly exhausted than ours. The soil is more rolling. This process will probably go on more slowly here but it will go on all the same and you all know it is going on. The general apathy and disinterest of farmers for engaging more in live stock in Illinois in the rearing and feeding of live stock is the one discouraging fact of our Illinois agriculture. The rule is there are no cattle on the farms of Illinois, no feeding, no very extensive breeding. It seems a mighty hard problem to get people to take hold. I admit that live stock keeping and breeding is something of a higher study. It is the high school, so to speak, of farming. It is easier just to plow a little and reap a little and then sell a little off the farm and live a little and do the same thing over and over each year with grain farming, than it is to put the mind and head into the problems of profitable live stock breeding and feeding. Because it is more interesting and more difficult, that ought to be the strongest reason for stimulating a people who have means and intelligence.

I promised I would not keep you long, just to break the ice. If such a modest man as I can get up and start this then men like Frake and Wallace and more ought to tell us something.

Mr. Buckner—This question that is being discussed is one that has interested me a great deal. Somebody in some way or another kind of pushed me out in southern Illinois to being a worker in the Farmers' Institute, and when I found out that was their desire I began to think what it was that I knew that my neighbors didn't know that I should talk and instruct them. The thoughts that have been presented by Professor Thorne were indelibly impressed upon me and my thought was that the greatest calamity to the people of southern Illinois was the fact that they didn't have sufficient live stock. Then I began to look around to see why it was that my neighbors and myself did not keep more live stock and so I wish, Mr. Chairman, to discuss for a moment the question of why we do not keep and maintain more live stock. I think the thing that deters more men of small means from keeping live stock on their farms now is the question of farm fences and particularly is this a fact since the stock law went into effect. The question I have undertaken to impress upon those who have listened to me, if you have got a stick of timber that will make a post for pity sake hang to it.

Barb wire will not turn sheep. I am a sheep man and I am a firm believer if we want stock that will drop a rich fertile manure we want sheep, but we have not the fencing material. We need the netting fences, good material and good posts but we cannot get them unless we pay for the fence as much as the land is worth. Hence it is almost impossible for men of limited means to fence their farms. This is the answer why we don't keep stock.

I might say that I came up to this State Farmers' Institute, surprised to find the harmony that exists between the thoughts of the speakers and our thoughts. I have made this suggestion. I believe the thing right in theory but the leading objection why we don't have more stock is the question of fences. If there is anything that can be said along the line as to how we can have fences, I would like to hear it. I make this suggestion to encourage thought. It is a barrier that rises before me and prevents me and my neighbor largely from keeping stock.

Mr. Curry—Gentlemen of this convention: I live in the north part of this county. I don't know why more men don't raise stock in our community. They are men who are honorable and hard working men. Men who buy their farms and take care of them. Then there are the men who own farms and rent them and take every dollar they can off of them; they don't give the tenant a chance to raise stock, they move to town and the renter has got to do whatever he can to make his rent. He has no show in the world to handle stock to make the farm better. What are you going to do? These farms must fall into the hands of men who don't move to town. They must fall into the hands of men who depend on the farm for a living. Not farmers who buy the farms and rent them to somebody else and take every dollar and let the renter make his money as he can.

Mr. Wallace—Since I have come to Bloomington this time I have run up against two classes ot people, one that tell me that this land is inexhaustible in its fertility; that they have farmed it for 35 years and it is getting better and better all the time; and then I ran up against the Professor this morning and I asked him what must we do to be saved from buying commercial fertilizers. He told me they must buy commercial fertilizers. Now I don't believe that and I don't believe either of you. While I believe it is true that theoretically your soil is inexhaustible yet I believe you can exhaust the available fertility in a comparatively few years, probably in 25, 30 to 35 years. But that is not the trouble with you. The trouble in Illinois is deep seated. It is a landlord State. The blacker and richer the soil, the more landlords to the square mile. It is a corn growing State and you have corn markets on the south, on the north and the middle and your corn is 5 cents higher than in Iowa and when you come to feed steers the Iowa man can beat you to death. For that reason you are being forced to grow corn and you become corn raisers just like the cotton raisers down south and you don't know anything else and the only thing you have to do is to keep on growing corn until you say: What must we do to be saved?

Mr. Kerrick—I think it is not far from the truth. There are farmers who live on the farms and don't raise much more stock than the tenant farmers.

Mr. Wallace—They need conversion.

Mr. Kerrick—That is what you are here for.

Mr. Wallace—It is not much use to talk to men until the white spot appears upon the horizon. Until you are convinced of sin, of soil robbery, and the only thing that will touch the most of you is the pocketbook. If your rents go down and you find your soil is being exhausted you corn growers will plunge into stock raising and it will be new work and you will finally wash your hands of the whole business.

The northern part of Illinois has no trouble for they have dairying there but you miserable old duffers quit dairying and you have got to get back to it and you have difficult problems to solve and you must solve them in time before your soil is too far exhausted. I don't believe it is necessary for us ever to grow to use commercial fertilizers on the ordinary best land you have, I think in southern Illinois it is necessary, but if you are going to avoid it then you want in addition to feeding your vanity and going to church regularly to haul out manure every day in the year.

And the gentleman is right—you must have fences, and any man who loves his wife always gives her a new dress and every man ought to dress his farm and it must be horse strong and sheep tight. Then you can build up the fertility of your land.

Mr. Mason of Elgin—You have heard from central and southern Illinois, northern Illinois is largely interested in the dairy business and they have large barns on nearly every farm you will notice and they keep stock and are putting on more stock and this land is increasing in productiveness right along from one year to another. It is the successful way to do farming. In feeding out your crops your land will increase in fertility.

Mr. Wallace—How are you going to get the gentlemen in the black lands to do it?

Mr. Hobson—I believe Mr. Kerrick's expression was correct when he said that the tenants of this country were raising as much stock as the land owners. I believe it is true.

Mr. Hobson—I feel as a farm tenant that I can't afford to do without stock. Somehow or another the impression seems to prevail that the reason tenants and farmers are raising corn and oats for market is because it is more profitable. I have not found it so on land that is rich enough to bring $150. I have paid $5.50 an acre and get the best prices for the corn I raise and the by products in the growing of the right kind of stock, and I believe the young man and the tenant farmers should become educated so that they can judge cattle and sheep so as to tell the particular type that will give him the best profits. I think not only the farm tenants but the old farmers will want to market their products that way.

I know I am not saying this at a very favorable time for feeding cattle. I have cattle at $6.50 that I am feeding 24 cent corn to on the farm. Mr. Kerrick knows I will get more for the corn than I will get for the corn at the elevator. We want to educate the farmers so they can tell the kind of stock, and as has already been stated it is an interesting study. I don't know what kind of a calamity would have to overtake me that would keep me from handling stock. I have to have it. They have been associated with me in my business so long and with the boys the same way, and if you are not careful they will always be shewing off the stock. I believe they are food for study, cattle, hogs, sheep and horses, and they associate with them and they will pick out the kind of cattle or hog that will develop into animals that will bring the highest prices for the food they consume.

I think the solution of the matter is to get it introduced. You let them get a hold of it once and it will then only be a question to keep them from it.

Chairman—This subject is not exhausted, but we will be compelled to close.

FEEDS AND FEEDING

(By Prof. H. M. Mumford.)

The largest question is not what particular ration ought to be fed to some certain class of live stock but to establish principles upon which practice may be based. To fix the principles we must be alive to their importance. I have small doubt that every man within the sound of my voice beleives that much depends upon our knowledge of feeds and feeding.

That it is an all important subject is easily said and easily forgotten. If what I have to say, does not help us to more fully realize the importance of a thorough knowledge of the underlying principles of animal nutrition, and if it is not said in such a way to impress us with its importance for all time to come, I shall feel that I have fallen short of making the best use of an opportunity and a responsibility which your institute has thrust upon me.

We live, and I am glad our people are beginning to appreciate it, in a section of country possessing many advantages unequaled by any similar area in the world. It is a household word that our chief reliance is upon the products manufactured in feed lot and factory from corn and blue grass. In my own mind clover and alfalfa should not take second place to bluegrass. Naturally a discussion of the subject of feeds and feeding, to be helpful, must center around these crops for which we are famous.

Corn is, and it is right that it should always remain so, the basis of our rations for live stock. How best to untilize it is yearly becoming a more vital question.

Never before in the history of agriculture has the importance of the subject of feeds and feeding been so universally recognized. The generation now growing gray can reflect with interest upon the fact that within their remembrance truly marvelous changes have been wrought in the methods of feeding. No longer do progressive feeders believe that it is profitable to shovel out corn by the wagon load into slush and mud necessitating a large percentage of total loss of food as was the former custom. On the contrary the hopeful tendency of the times in animal production is the effort to so conserve the products of the soil suitable for this purpose that the ultimate percentage of waste will be exceedingly small.

The soil is beginning to be looked upon by the farmers as the ultimate source of wealth. Political economists have long since stood ready to impress the fact upon us. We have persistently looked with mild complacency upon their meaning efforts. However, grim necessity is an earnest, if not an agreeable teacher.

The souce of all wealth and especially our wealth has been gradually, but surely becoming impoverished. Past generations have freely accepted the bounteous gifts of nature. It has been left for the young men of today to become fully awakened to the problems involving the changes of modern agricultural practice that have taken place and how best to avoid mistakes of former methods. Progressive farmers with the aid of the experiment stations of the United States are following up and investigating every factor that may have a direct or indirect bearing upon the questions, how may our lands be rendered more economically productive both by the increased production of staple and recently introduced crops without leaving our lands to our children and our children's children less productive, less desirable and less valuable.

Cheapened production will not, and I doubt not, cannot keep pace with our ever-increasing domestic and foreign demand for the products of our land, our stables, sheep folds, pig sties and feed lots. Small wonder, then, that agriculturists everywhere, and especially up and down the length and breadth of this great commonwealth, are crying out as if in distress for help along any avenue that promises relief from a situation that our most far-seeing rural population believe is the animal husbandry problem of the age, namely, the profitable production of animal products of higher quality.

We know of no occupation, coupled with skill and good judgment, that calls for a higher order of intelligence, or one wherein those things count for more than when they are directed along agricultural lines. The problems arising in the various agricultural lines are nowhere more numerous, difficult and complex than are the problems arising from the questions of animal production. While it would be unfair to say that the question of feeds and feeding is of more importance than that of breeds and breeding, it will at once be recognized that every man who handles stock is interested in their intelligent feeding, while a farmer may or may not lose from a lack of knowledge of the principles of stock breeding. We cannot expect in the short time at our disposal to more than touch upon a few of what seem to us to be the most important phases of this subject. Some suggestions are offered in the way of general principles which apply to all animal nutrition. A study of feeds and feeding in modern times has resolved itself largely into a study of the food requirements of the various classes of animals as subjected to various conditions, and how to meet these several requirements in the various sections of our grand country. Whatever may be the faults of the German feeding standards, we believe it is safe to say that they have done more to inspire a careful study of the problems of animal nutrition than any other one factor. Thousands of men are annually going into the business of breeding and feeding live stock who have practically no knowledge or experience of the business. These men have hailed with delight any information which appeared to furnish accurate data on the amount or kind of food required for the various classes of animals. Practical feeders, who have fed to their animals the products of their land without regard to their adaptability for producing the desired results, have gradually learned here and there to change their methods to conform more closely to the requirements of the animal, and thereby they have secured better results. The most careful students of animal nutrition believe that the value of feeding standards lies in their suggestiveness. They do not look upon them as an absolute guide.

Given any class of stock which we desire to feed in a way to secure the best results, the main points to decide are, what shall be the nature or composition of the ration and its amount? These questions settled, the next one to consider is, how shall these required digestible nutrients be supplied?

In Henry's "Feeds and Feeding" and Jordan's "The Feeding of Animals" and other books of a similar nature will be found feeding standards for farm animals. In these tables are given the number of pounds of dry matter, protein, carbohydrates and ether extract required daily per thousand pounds live weight of the animal. As has been stated before, these amounts must not be considered final or absolute, but looked upon rather as a guide. In fact, it will seldom be good practice to feed an animal of a given weight the exact amount of a ration so made up that the average digestible nutrients shall precisely correspond to the requirements of the animal as given in the table. Taking the amounts given in the feeding-standard tables as a guide, we set about to make up a ration which will correspond to this standard by the selection of available food stuffs. Almost invariably it will be found impracticable to make the sum of the digestible nutrients of the food stuffs used in making up a ration correspond with that given in the feeding standard. In the preparation of rations for farm animals the following factors must of necessity be considered if the best results are secured: First, palatability; second, the efficiency of the ration; third, the cost of the ration; fourth, the relation between the efficiency and the cost, and fifth, the effect of the ration upon the quality of the product.

PALATABILITY.

It is obvious that a ration is not well calculated to meet the full requirements of the animal unless it is palatable. It is well understood that a certain amount of food is required to maintain the animal so that there will be neither a loss nor gain in live weight or other expenditure of energy or other production of any animal product. A ration which is not agreeable to the animal may keep the animal from starvation. One that is fairly palatable may constitute a reasonably satisfactory maintenance ration, but only rations of the highest palatability can be depended upon to produce a maximum amount of work, flesh, fat, or milk. Large production along any of these lines necessitate the consumption of large quantities of food stuffs, an impossible condition if the ration is not highly palatable. Here is where practical experience and judgment are required to supplement scientific investigation. A ration may be so made up that it will conform absolutely to the required standard, and still the animal may utterly refuse it, or refuse to eat it in sufficient quantities to produce the results demanded of the animal. In making up rations, we should know in general, the percentage of roughage and concentrates which have been found most desirable. That is in fattening steers, should one-half of the ration be made up of concentrates and the other half of roughage or should it contain two thirds concentrates and one-third roughage? This suggests another point that while a ration made up very largely of certain forms of roughage might be highly palatable, and while if fed in sufficient quantities, such a ration would contain the proper amount and proportions of digestible nutrients, the animal could not consume a sufficient quantity to produce the results demanded by the feeder.

It is a fact known as a result of experience that the greater the work performed by an animal, the more milk and butter fat, the more mutton, the more pork, and the more beef produced, the higher the percentage of concentrates required. By forcing an animal to its full productive capacity we aim to secure the greatest digestive and assimilative efficiency of the animal by making the best use of its digestive and assimilative capacity. This can not be secured by feeding a large percentage of roughage which contains a relatively high percentage of crude fiber which is principally cellulose and which requires for its digestion a greater expenditure of energy than the digestion of most concentrates. For example, when steers are first put into the feed lot and are allowed to eat clover and alfalfa hay, the corn ration is small, the percentage of corn to hay by weight may be as 1.3. As the feeding progresses and the grain ration is gradually increased, the percentage of hay to grain diminishes until during the last period of the fattening process the proportion of grain to hay may be as 3.1, or in other words, at the beginning of the feeding there may be three times as much hay fed as grain, while at the end, three times as much grain as hay. It is assumed that the digestive capacity of the steer remains practically constant, hence, if the maximum productive capacity is demanded of the animal, the ration must be so varied that the best possible use can be made of this capacity by reducing to the minimum the energy required in digesting the ration.

EFFICIENCY OF RATIONS.

The efficiency of a given ration depends among other things upon: (a) content of digestible nutrients, and (b) digestibility and assimilability. The content of digestible nutrients of a ration is of first importance in a consideration of the efficiency of a ration. As has been stated a large number of experiments have made it possible to state with some degree of accuracy what the digestible nutrients of a ration intended for a certain purpose should be. It will be convenient to familiarize ourselves with the chemical composition of a number of our common food stuffs. Especially should we be able to tell without hesitancy whether corn the most available food stuff in the corn belt is highly nitrogenous or highly non-nitrogenous. Again I say that here in the corn belt, every known chemical property of corn should be thoroughly understood to the end that corn and its products may be used to the best advantage. The accompanying tables show clearly what an important factor of food stuffs digestible nutrients are:

DIGESTIBLE NUTRIENTS IN 100 POUNDS.

Concentrates.	Dry matter.	Protein.	Carbohydrates.	Fat.	Nutritive ratio.
Corn	89.4	7.8	66.7	4.3	1.98
Oats	89.0	9.2	47.3	4.2	1.62
Wheat bran	88.1	12.2	39.2	2.7	1.37
Gluten meal	91.8	25.8	43.3	11.1	1.27
Linseed meal, O. P.	90.8	29.3	32.7	7.0	1.16
Cotton seed	91.8	37.2	16.9	12.2	1.12
Whole milk	12.8	3.6	4.9	3.7	1.38

DIGESTIBLE NUTRIENTS IN 100 POUNDS.

Roughage.	Dry matter.	Protein.	Carbohydrates.	Fat.	Nutritive ratio.
Corn silage	20.9	0.9	11.3	0.7	1.14.4
Corn stover	59.5	1.7	32.4	0.7	1.20.0
Clover hay	84.7	6.8	35.8	1.7	1.5.8
Alfalfa hay	91.6	11.0	39.6	1.2	1.3.9
Timothy hay	86.8	2.8	43.4	1.4	1.16.7
Oat hay	91.1	4.3	46.4	1.5	1,11.7
Cowpea hay	89.3	10.8	38,6	1.1	1.3.8
Oat straw	90.0	1.2	38.6	0.8	1.33,7

Feeding standards are constructed with the idea of suggesting rations containing the proper total amount and the proportionate amount of the various nutrients required to make such rations the most efficient without any regard to the cost of such ration. That, is, the effort has been so to combine the various food elements that the feeding of a minimum amount of food stuffs will result in maximum production, regardless of whether such production is profitable or not. It is assumed that the feeder will use judgment in the selection of food stuffs most available or which can be bought and used to the best advantage.

A study of feeding standards leads us to the conclusion that a ration to be properly balanced and most efficient should contain about one part of protein to seven of carbohydrates and fat. This is what is called the nutritive ratio of a ration and does not vary materially for different classes of animals. Kentucky blue grass has a nutritive ratio of 1:7.2; oats, 1:6.2; corn 1:9.8. Thus we see that blue grass by itself is practically a balanced ration. Among the concentrates, oats, rye, barley, and wheat form in themselves nearly balanced rations, while narrow rations are to be found in cotton seed, linseed, and gluten meals, and wheat bran. Such roughages as clover hay, alfalfa, and cow pea hay contain sufficient quantities of protein to render rations made up wholly of them, narrow rations.

As we have seen, corn contains digestible nutrients in such proportions as to make its nutritive ratio wide. The nutritive ratios of most roughages are wide; for example, the nutritive ratio of corn silage, which may be considered both as a roughage and a concentrate, is 1.14.4; corn stover, 1.20; timothy hay, 1.16.7; oat straw, 1.33.7. We hold that it is good practice in compounding rations for specific purposes to use corn as the basis. As we have seen, corn is low in its content of nitrogen or protein. To make a ration made up largely of corn efficient, we must therefore add to it some nitrogenous food stuff. This may be done by the use of a concentrate or a roughage. The cheapest source of protein is in nitrogenous roughages; hence it stands to reason that with corn as a basis, we should first add as large an amount of nitrogenous roughage as is good practice. Then, if our ration is not properly balanced, and if the relative cost of food stuffs as compared with the market value of corn makes it desirable to make it so, we should add a sufficient quantity of some nitrogenous concentrate to make our nutritive ratio correspond pratically with the standard. In adding a nitrogenous concentrate we should of course give preference to one that furnishes a maximum amount of protein at the least cost, and finally the one that returns to the land the most valuable fertilizing constituents.

As has been intimated, the ultimate purpose of food taken into the body is to supply the nutrition.

To nourish the body, food must be digested and assimulated. A highly efficient ration must of necessity be one of high digestibility. The digestibility of a given food stuff depends upon the nature of the food stuff; that is, whether it is highly concentrated or composed largely of cellulose, and whether this less concentrated nature of the food stuff prevents it from becoming thoroughly masticated. We believe that further efforts must be made to improve the mechanical condition of the ration in order that it may be more thoroughly masticated and more easily attacked by the various digestive juices.

Professor Plumb of the Indiana Station and Professor Cottrell at the Kansas Station have shown that there was a decided advantage in reducing roughage to somewhat small particles and in mingling it with the grain. The Illinois Experiment Station is doing something along that line the present season. Dr. Armsby at the Pennsylvania Station has shown that the treatment or management of the animal has an important bearing upon the efficiency of a given ration.

In regard to the management or treatment of the animal as bearing upon the efficiency of the ration, we might say that experiments and experience have both shown that the largest and most economical gains are secured where fattening steers are fed in open sheds with adjoining feed lots.

In talking with a cattle feeder of long and successful experience recently, the writer was led to believe that it was the judgment of this feeder that cattle feeders in general were more in need of help as to how to make cattle comfortable than upon any other subject. Last year's experimental feeding at the University of Illinois Experiment Station led me to believe that the condition of the feed lots had as much to do with the extent and economy of the gains as any other one factor. This subject needs careful study at our experiment stations.

A point which should not be overlooked in connection with the factors influencing the efficiency of rations, is the method of feeding. We refer in this especially to the point as to whether the self-feeder is an economical method of making meat? This question has only been answered in sheep feeding. The Experiment Station of the University of Illinois hopes to make a test of this in fattening cattle during the coming grass season. In the average of three years of fattening lambs on the self-feed, it required 9.57 pounds dry matter to produce one pound of gain, while under the ordinary twice a day system of feeding by an intelligent and skilled feeder, it required only 6.97 pounds, a difference of 2.60 pounds dry matter for every pound of gain made by the lambs. This reduced to dollars and cents, under average condition of prices for feed stuffs, means that every pound of gain made under a system of "self-feeding" cost just 1½ cents per pound more than where the lambs were judiciously fed under the twice a day system. It is figured that with convenient equipment, one man could feed 1,000 sheep. A reasonable total gain per day on the 1,000 sheep would be 300 pounds. If the sheep were fed instead of being self fed, there would be a saving of $4.50 per day; very good wages for a skilled feeder—even the proprietor might undertake to do the feeding himself under the circumstances. Not only were the gains much more expensive, but they were much smaller or at any rate less rapid.

It may be necessary to impress the importance of the subject of an attempt at least to make a ration partly balanced if we expect to secure profitable returns.

At the Missouri and Illinois Experiment Stations it has been found that the simple difference of using clover instead of timothy hay as a supplement to corn has made a difference of 7 to 8 cents per bushel of corn used in favor of the use of clover hay. And so we might go on enumerating the factors that enter into the proper understanding of this important subject, but time will not permit. We have briefly called attention to some of the more important points of animal nutrition in what we trust has been a suggestive way; in a way that may lead to more careful study of the question. For one, I am glad that feeds and feeding is not a simple and easily grasped subject, and we believe we but voice the sentiment of an ever-increasing number of young men when we say,—how fortunate that the changes which time have wrought have rendered profitable crop and profitable animal production; a business, or I may say a profession where only intelligent effort will be sufficiently remunerated. Perhaps never before has it been safe to predict that the same degree of intelligent effort directed along lines of crop and animal production will be as well paid from a monetary standpoint as in any other legitimate business, while the advent of better transportation, better mail and better telephonic communication has removed from the pursuit af agriculture its most objectionable features.

The young man who is ready to step out into the activities of a life on the farm who has taken advantage of every opportunity to thoroughly equip himself for his life's work is to be earnestly congratulated. I firmly believe that the young man with such predilections and such training,—I care not whether he is rich or poor,—has before him the grandest opportunity of modern civilization. An opportunity is afforded him to become independent financially, a condition which brings the comforts of life to himself and family and more than all the opportunity is afforded to rear a family under natural conditions where something is found for each member of the family to do, which will help to contribute to their maintenance and prepare them for the sterner realities of life; where busy fingers and constant contact with nature and her purity leaves little place for evil thoughts or acts. Parents who give their families an opportunity to make the most of spending their young lives on the farm have conferred a lasting benefit not only upon the children, but upon humanity as well.

NOTES.

The final object of food is to supply nutrition. This nourishment may be supplied by rations, the use of which is attended by small losses of digestible nutrients, or it may bo supplied by rations where the losses of such nutrients are relatively large.

Rations containing the same amount of digestible nutrients and in the same proportions may also vary much in cost. Rations equally efficient may vary much in cost.

Rations of theoretically ideal composition may or may not be efficient. They are efficient when palatable and when so made that the animal can and will eat, digest and assimilate sufficient quantities to produce the required results. They are not efficient when so made up that the animal will not or cannot eat them in sufficient quantities.

The most efficient rations are not always the best to use. In the corn belt it seldom pays to use the ration of highest efficiency because of the relative prices of food stuffs upon which we rely for our chief sources of digestible nutrients.

The proper proportion of grain to roughage depends largely upon the nature and quality of roughage. Ordinarily, in fattening steers we start out with the feeding of about three pounds of roughage to one of concentrates. As the fattening period progresses we reduce the proportion of roughage to grain until at the close the steers will be getting about three pounds of grain to every pound of roughage.

Many good dairymen believe that three-fifths of the ration of the dairy cow in full milk should be roughage. In fattening sheep the amount of roughage and concentrates may be about the same. The more highly nitrogeneous the ration the larger the proportion of roughage that can be fed to advantage. The better the quality of roughage and the more highly nitrogeneous the roughage is, the more it is safe to feed.

Violin solo—Harry Burke.

Address on horticulture by Prof. U. P. Hedrick of the Agricultural College of Michigan.

THE APPLE.

Professor Hedrick, of Michigan.

Should we attempt to select the fruit of fruits, as the season's pageant passes by, could you or I declare which one of all we love the best? Headed by the stawberry and ended by the apple, each with its own beauty of color and form and each with its own distinct and delicious flavor and aroma, how could we make a choice?

But given time to make comparisons and to consider, no one need necessarily hesitate long. When we have considered all the fruits in regard to every definable and indefinable quality, which, united, gratify the greatest number of senses; with respect to number of varieties, each possessing distinct qualities; with nutritive and hygienic properties in mind; and as to uses; length of season; and general distribution, we shall find that the apple is sovereign of all. The apple has ever been the leading money making orchard crop of America. Its pre-eminent merits for the market, added to those which make it the favorite fruit, are that it stands transportation better than any other; it can be kept in the fresh state throughout the year, and the trees are easy to care for, long lived and very productive. The apple, then, as chief of fruits for the consumer and producer must be of interest to you, but I have chosen it as the subject of my address today, not alone because of its intrinsic interest and value, but for the added reason that it, of all fruits, best enables me to discuss principles and to set forth lessons of value to the general fruit grower. Permit me then to speak for a brief time on the apple with special reference to Illinois.

I preparing this paper I have made use of the Transactions of your State Horticultural Society, and, if I may judge from the published description given of the orchards that existed here a quarter century ago, this region must have been an apple Eden. Unlimited quantities of perfect apples could be purchased for a shilling a bushel, and in many seasons could be had for the picking. The trees were healthy, vigorous and productive to a fault. Fruit was to be found in every cellar until the returning season brought the new crop. The basket of apples and the pitcher of cider were the abettors of every social gathering. Autumn was enlivened with apple-paring bees. In the spring, as the barrels and bins gave out, the pit in the garden yielded its treasures. This was eminently an apple region.

Shall I draw the contrast between then and now? It is a painful one to the lover of fruits. Can Illinois now be called an apple region? How many farmers grow their own supply? Can you children go to the bin in the cellar and pick out a russet, a greening, a talman or pippin by touch as you could? I need not answer the question. You still have apple orchards, such as they are, but, alas! if I may judge from your horticultural writers, the apple crop on the farm is almost obsolete. The trees bear other crops—moss, lichens, canker, scale, fungi, insects, worms, and a never-failing crop of birds build their habitations in the apple tree, sure of insect food to supply their greedy young. Have I overdrawn this, and should I not mention still other pests as mice and rabbits at the trunk?

But I must hasten to the great problem. To what evil influences or influences shall we attribute the degeneracy of the apple orchards of this region and of this State—a State once somewhat famous for its apples? The downfall of the apple in my state—Michigan—is attributed to several causes, and I take it that the conditions there are much the same as here. These causes I shall attempt to discuss. The most common theory is that there has been a great and deleterious modification in the climate.

But are the failures due to a greater severity of climate? It is difficult to find records to prove that the climate is more severe. We must rely entirely on the memory of the old settlers, whose recollections vary somewhat with the present state of weather: In the winter they tell us our climate is surely getting colder; in the summer the climate is beyond question getting hotter and hotter. But in a general way we are led to believe that the climate is somewhat more severe. Tender vegetation, as the peach, is less grown now than 50 years ago, not because of any real change in the climate, but because the country now is bleaker—is more open to winds and cold waves. Such bleakness always follows the destruction of forests. No, your climate is still for most part an ideal one for apples. The same breeze, delightful to this fruit, fans the cheek of the apple as it tempers the heat of the summer or takes off the rawness of winter. The same sunshine, abundant in summer and autumn, turns acid to sweetness, adds flavor and aroma, makes hard fruits mellow and changes the green to gold and russet. It is not the climate.

Is it the soil? Aye, here we have subject for thought. Year in and year out the orchards were loaded with the fairest of fruits, representing the quintessence—the very life of the soil. Have returns been made for this bountifulness? In most cases not. Each succeeding year finds the soil of our orchards poorer. The most potent cause of our apple failures is soil exhaustion. Proofs are numerous, if reason does not suffice to show that such results would naturally follow. Plant a young tree in place of an old one in a neglected yard. It dies of starvation. Compare an orchard that has been well fed with one that has been under-fed. The former is more fruitful, the trees are larger, more vigorous and are longer lived. Take an old orchard and nourish it, give the soil its virgin strength; the trees revive and soon approximate their former vigor. The orchard soils were formerly rich in all elements of fruit production, but now, in most cases, the food account has been greatly overdrawn, and the result is inferior fruit, unthrifty trees and orchard failure. In the virgin soils of long ago and until the old orchards came to maturity no fertilizers were needed, but now most orchards imperatively demand more food. Stable manure, cover crops, potash and ground bone, in varying combinations to suit different conditions, are the chief essentials of the diet required by orchard trees.

But soil exhaustion from the trees is not all. Seemingly acting upon the relief that fruit trees do not require food, moisture and space, many farmers and some fruit growers have put their orchards out to grass. What are the effects of grass in an orchard? What are the effect of grass in a corn field, in the potato patch and in the strawberry bed? Why need we expect different results in a double cropped orchard from those in a double cropped corn field or garden? Theory and experience are diametrically opposed to the sowing of grass, or any other crop, in an orchard. Read Bulletin 52 on "Orchard Cultivation" for your experiment station and note in the carefully conducted experiments there recorded the superiority of the trees grown under clean cultivation as compared with those grown with oats, corn, clover and blue grass. The conclusion, placed in italics is, that "*Under no circumstances should hay or any grass crop be grown on orchard land.*"

For a half century the orcharists of America have disussed the question of grass or no grass in the orchard. In bulletin and horticultural press it has been proven over and over again that grass in an orchard diminishes the growth of trees, weakens their vitality, makes them more susceptible to the attacks of insects and disease, that the grass takes the cream of the land, that its shade entices the apple rootlets to the surface there to be killed by drouths, that it robs the trees of much needed water, and that, in general, half the ills of our trees come from the monster "blue grass." And now when we had thought that the monster had been laid low, was ready to be buried, and even before the memory of thousands of ruined orchards, sodded and grass mulched to death, is out of mind, we find that "we have scotched the snake, not killed it," and that an eminent eastern agricultural paper with a respectable following of horticulturalists is singing the praises of grass and grass mulch, in the so-called Hitching's system of cultivation, for the orchard. We say down with the Hitching's system of grass mulching orchards. It may be a successful proceedure in some parts of the country but the reason and experience of a whole nation of apple growers is against it as a general practice. Down with it as a make-shift for a lazy man! Down with it as a rank heresy in the modern horticulture, the chief emblem of which is the cultivator!

This brings us to orchard tillage, a subject so often discussed that we shall but briefly mention it here though we count it all important and its lack as the greatest curse of the farm orchard. The effects of tillage on soil and plant growth are known to you all and need not be repeated; nor need I go into details as to implements and methods as these must vary with every condition and hence with nearly every man. I only want to urge the necessity of cultivation—judicious cultivation of course, for there can be too much of a good thing. The soil needs each year a thorough turning up in the spring, and a shaking out now and then in the growing season, that the sunlight and air may thus enter in, furnishing life giving oxygen to the roots, enabling myriads of bacteria to live and work, conserving moisture, and unlocking the store rooms of potash and phosphoric acid. In the words of J. H. Hale, the great peach grower: "Culture, culture, culture, is the sure road to success, while any other scheme of handling the orchard is nearly sure to lead the other way."

A third cause of failure is the enormous increase in insects and fungi, not only in kinds but in individuals of original kinds. It is easy to see to what this increase is due. Man has destroyed the natural food of a great host of pests and they have thus been driven to seek cultivated plants. Again, the food in the orchard is in a small compact area and pests increase more rapidly, just as diseases spread more rapidly in cities than in the country. Through increased facilities for transportation great numbers of pests have been brought from other countries. The majority of our injurious insects and fungi are foreigners. Lastly, pests are now enjoying a wonderful opportunity in our orchards awaiting the time when nature shall send checks in shape of disease or parasite. While pests have thus increased for half a century, systematic attempts to destroy them did not begin until a little over a decade ago, and do not yet nearly counterbalance the increase. The recent influx of pests is discouraging to even the strongest hearts at times. From experience we know well that we may continually look for new enemies. It seems sometimes that the plagues of Egypt are upon us.

But as insects and fungi have increased our knowledge of them and how to contend with them has increased. Our means of combatting them are almost perfect, and none but the slothful need grow wormy, scabby, blighted fruits. Moreover experience reassures us that nature comes to man's aid and in manifold ways helps in the warfare against our tiny foes. Insects and plant parasites in their turn have enemies and competitors which serve to keep them in check. The chinch bug and grasshopper have had their reign of terror; the potato-bug is not now feared as it once was; the codlin-moth has passed its zenith; and we may expect nature to aid us with all pests in the future as she has in the past. Again, the fruit grower in his zeal to overcome the pernicious insects and fungi of the orchard has invoked the aid of State and National legislatures and the strong arm of the law now gives our orchards added protection. Scarcely a state but that has its insect and plant disease laws, enforced by inspectors and quarantine officers. But at this point I must hasten to urge that the fruit growers do not place too much reliance upon their allies—nature and law—in this warfare. Nature does not do all and law cannot. The fruit grower must do his part which is no small one—amounting in fact to the brunt of the battle. We are given dominion over our foes only as we strive to overcome them. The successful fruit grower, then, must equip himself with modern spraying armament and ammunition and inscribe upon his banner "By these we conquer."

Another weighty reason for the failure of our orchards is the prevalent nursery practices whereby our trees are propogated from poor, worthless and barren plants. No two trees produce equal amounts of fruits; the product is not of equal beauty and quality; there are varying degrees of hardiness, vigor and longevity among the individuals of any variety just as there are varying qualities among the individuals in a herd of Shorthorns. The nursery man and plant grower have exactly the same opportunity to breed and improve plants that the growers of animals have. We want for our orchards trees propagated from parents of known good qualities. In many cases the orchardist must supply scions and buds and the nurseryman must not be expected to do the impossible and must not be blamed for all our short-comings in plant-breeding.

This brings us to the general problem of the improvement of tree fruits. Can a variety propagated by buds or scions be improved? The notion prevails that it cannot and that our tree fruits are fixed, unchangeable and restricted to certain definite forms. This notion is wrong, is the reverse of truth, and is highly detrimental to horticulture. Varieties are more or less plastic and can be remodelled within certain limits. The Concord grape is a better grape now than when Ephram Bull introduced it. Most varieties of stawberries are changed so much in a decade that the original type would scarcely be recognized. That varieties of apples can be improved was strikingly shown by George T. Powell at the recent plant breeders' conference in New York City. He exhibited specimens of Sutton's Beauty of extraordinary size, high color and great beauty which he said were the results of careful selections of scions for three tree generations. Besides the characters mentioned Mr. Powell had sought for and secured fruits of uniform character and trees of increased vigor and prolificness. It seems to me that we cannot emphasize too strongly the fact that existing varieties can be improved by careful selection of buds and grafts in propagation.

In the way of improving fruits by originating new sorts the fruit grower can do but little. The specialist finds here a fertile field. Not infrequently, however, the fruit grower comes upon valuable chance seedlings and bud variations, and these should be carefully watched for with a view to propagation and dissemination. Much pleasure and some profit may arise from careful work in hybridizing though for most of us hybridization is but a game of chance. For tree fruit, where selection can play but a small part, the chief consideration in hybridizing is to secure worthy parents. With the Duchess of Oldenburg for a mother and Old Ben Davis for the father, what could you expect of the offspring?

One other reference to nursery stock and I am done with this phase of the subject. Each of our great fruit regions has come to have a list of varieties peculiar to itself, and the fruit grower can expect but few sorts to thrive in widely separated regions. The Ben Davis may thrive in Illinois and Missouri, but it will not, thank heaven, in Michigan, and neither will the Northern Spy, our leading apple, thrive with you. Some choice sorts which you have positively refuse to grow with us. Fruits adapt themselves to environment, and you must observe Nature's hint and plant only sorts suited to your conditions. Less general application, but still of importance, is the fact that trees grown in any locality cannot be expected to do as well in other localities, and, other things being equal, it is important that you should buy your nursery stock as near home as possible.

Another varietal question of general importance is the special purpose versus the all-purpose sort. A parallel controversy has long raged among cattle breeders, and has been settled, I believe, in favor of the special purpose animal. It seems likely that the fruit grower will reach a similar conclusion. More and more the test of a variety is, not that it have a greater number of surpassing qualities, but that it will fill some one or few definite needs well. The money-making horticultural variety today is the very earliest or the very latest of its kind, or the best shipper, or the best keeper, or the best for canning or drying, or, and we pay too little attention to this point, it should be the best in quality. Consider well the special purpose varieties, for they are bound to predominate.

We now come to the third division of my subject—what of the future? Can we rejuvenate the old orchards or must we plant new ones? Many old orchards can be improved and possibly made profitable by thorough enrichment, careful cultivation, pruning and spraying—operations that you have all heard discussed in this connection times innumerable. For the farm or the home this plan may be worth the while, but for a commercial orchard, or for the young man, or the up-to-date fruit grower, I doubt if an old orchard can be made very satisfactory. In most cases the new must take the place of the old. There must be new varieties or new combinations of the old; new methods of planting, of heading and pruning; a greater use of cover crops to keep the soil in good tilth; more vigilant and intelligent care in cultivation to start the roots rightly, and treatment from the first to keep out insects and fungi. Our fathers considered the orchard an adjunct to the farm. Fruit was always a secondary consideration. An orchard to be profitable now must have first consideration. We must come to realize, too, that apple growing is not all one grand, sweet song, and that it requires infinitely more labor and thought now to grow apples than it did a generation ago. But the difficulties are not insurmountable. The orchard demands only the attention commonly given to field crops, with the addition of the fight with pests. The greater the obstacles to be overcome, the greater are the awards of those who succeed.

If I were to give specific advice as to the treatment of old orchards it would be in brief as follows:

1st. Get into the orchard with the pruning saw. For this work you need men of experience. Too many so-called tree pruners are tree butchers. Their zeal is much greater than their knowledge. The only absolute rule in pruning that can be laid down is to cut out all dead wood. Branches that are badly injured, diseased, crossed, or that from weak crotches should be removed after which some small limbs may be cut out and if the tree top is very thick there should be a judicious thinning of large branches. Let the pruning extend through two or three seasons rather than one.

2nd. Nearly all old orchards are in sod. This must be broken up—absolutely must if success is to be attained. Start its cultivation and keep it going. Plow in a good dressing of stable manure, or plow and then harrow in a good dressing of fertilizers rich in potash and phosphoric acid. In the words of the parable of the barren fig tree, "dig about it and dung it."

3rd. With a short handle hoe or some kind of a box scraper remove the old rough bark which shelters innumerable insects and fungi and then spray thoroughly, while the trees are in the dormant condition, with copper sulphate at the rate of 1 pound to 25 gallons of water.

4th. Make up your mind to feed, prune, spray, sow cover crops and cultivate the orchard for the remainder of its life. If the orchard fails to appreciate the treatment outlined above cut it down and plant anew. "Why cumbereth it the ground?" Do not expect too much nor look for quick returns. "As the twig is bent the tree is inclined" and a season or two of good care cannot make up for a lifetime of neglect. Do not follow years of outrageous treatment with unreasonable expectations.

Will apple growing pay? The demand for apples in recent years has increased as has that of no other product of the soil. The value of most farm crops has gone down since war times, but the apple, which we shared with the pigs and cows forty years ago, is now a luxury which few of us habitually afford. Moreover we now ship apples in ways and to places never dreamed of a few years ago. We send them to Europe, to China, to the Klondike, and in ever increasing quantities. We ship them as green fruit, canned and evaporated, while the skins and cores are made into cider, vinegar and jelly, so that nothing is lost or wasted. Six counties in Western New York are said to have received over $5,000,000 for the apple crop of last season. The figures of the apple industry for the last decade are a grand sight. They show that the home consumption of this fruit has increased enormously, while the export trade has more than doubled every year. The car-load is the unit in trade now; formerly it was the wagon-load. But will this wonderful growth last, or is it one of the bubbles which periodically arise in the industrial world? If we study this question carefully and come to know wherein lies the growth and what manner of growth it is, we must conclude that apple culture has not yet reached its height and that the forward movement is gaining greater and greater impetus.

For years there has been a cry of over-production when newly set orchards come in bearing, but it has not come and will not come. As the production increases means of disposing of the product increase. Our methods of marketing constantly improve; fruit unions and coöperative methods make greater sales and handle the crop with greater ease; the cost of production is becoming less and less; the establishment of cold-storage, canning, evaporating, cider and by-product plants double the demand and will continue to do so; through refrigerator service and better transportation facilities the crop is now handled with less cost and at a greater saving in quality of fruit. There is not now an overproduction of apples, nor is there a prospect of one, and with the present outlook it may safely be said that no general crop will pay better than the apple.

Does selling groceries pay? Does preaching pay? You answer at once that it depends upon the style of the man and upon his location. And in the same words we answer, "Will apple growing pay?" A man with enterprise, dash and alertness, in a suitable location can more than make it pay. But the unsuccessful farmer, the broken down preacher, lawyer, doctor and merchant, the college man with only a smattering of science for his mental equipment, and the old time fruit grower, who will not spray, prune, nor cultivate and who mulches his land with sod, who will not take advantage of present knowledge and profit by past errors—he with the moss covered trees and the moss covered back—all men who cannot manage and have not business capacity—such can hardly make apple growing profitable.

To succeed in the modern industry of growing fruit a man must be a worker, must be in earnest. He must remember that "the weakest goes to the wall" and that in apple growing as in other industries a man must fish, cut bait, or get ashore." He must plant the proper varieties in the right soil and in the right manner. He must care for each tree as the shepherd cares for the sheep of his flock. He must guard them against all the assaults of the enemy. All orchard work must be well done. Must be done to a finish. In fruit growing it is a race between negligence and ignorance as to which is the greatest curse. He must unite with fellow growers for educational and business purposes. There must be no waste. By-products must go to the cannery, evaporator or vinegar factory. His fruits must be handled as if they were eggs. The pack must be honest—the same top, bottom and middle, and clean and attractive throughout. He must be in love with his work. "No profit grows where is no pleasure taken" and "the labor we delight in physics pain." With such growers the forecast for the future would be most inspiring. Illinois would again be a land of apples.

But there is more than money making in apple growing. There is much for the inner life in it. A man puts not only his handiwork in the apple orchard but his mind and soul are materialized into flowers and fruits and trees. An orchard gives a charm to the home and the farm and keeps a man there. Trees fill one with gladness. There is no place in the wholesome life of the apple grower for the devil to hatch his evil brood of anarchy, thievery, jobbery and meanness. The Almighty made Adam perfect and set him to tend apples in a garden. After he had consorted with Eve and the serpent, and had sinned and fell, he quit our profession and turned builder. And so, even though a man fail somewhat and never attains wealth, he may, if he looks at life rightly, aspire to have much from the apple orchard that wealth cannot buy. It should be something to be the owner of an orchard which one has planted and tended with his own hands; to see in old age the blossoms come and go, and to yearly catch their springtime fragrance; to have concerts on his grounds by the birds; to hear the cheery voices of children rejoicing in health and happiness under trees of his planting; to have the associations of rural peace and quietness, and to gather in autumn spicy harvests of golden and cinnamon fruits with cider making, and to have the winter luxury of apples, and so I make a plea for the sentiment of the orchard. Nothing can avert the doom of the orchard as you knew it in childhood. But as you plant the new, carry in your heart genuine love for the apple as well as for the money it brings. And now let me close with the sturdy invocation of Old Orchardist Gerard, who wrote nearly four centuries ago:

"Forward in the name of God: graft, set, plant and nourish up trees in every corner of your ground; the labor is small, the cost is nothing, the commodity is great; yourselves shall have plenty, the poor shall have somewhat in time of want to relieve their necessity, and God shall reward your good merits and diligence."

The discussion will be led by Mr. J. C. Blair of our own university.

Mr. Blair—I have listened, ladies and gentlemen, to a good many addresses on the subject of horticulture, but I want to say to you frankly that this is one of the best addresses which it has been my pleasure to listen to. It is not my purpose this afternoon to dwell upon the many excellent points which our Professor Hedrick of the agricultural college of Michigan has made, bu there is one thing in connection with the subject of horticulture from the standpoint of the farmer of Illinois which I must dwell upon, it is this:

No matter what line of agriculture we are following, no matter what system of farming we are following, we must not neglect the horticultural phase of the farm. We must not neglect the fruit and the vegetables. I know you will argue, you have said to me many of you: we are successful corn growers, we are successful stock raisers, we are successful in growing the general farm products, let us buy the fruits for our table. As I have traveled up and down the State, in almost every county in the State, I have asked myself, "How faithful are these stock men, these corn growers, these general farmers in supplying the farm table with the things which they could afford to buy? They do not do it. Not 10 per cent of the farmers go to town and bring home the fruits which are necessary, necessary from the standpoint of health and happiness in the home, and so it leads me to say emphatically, no matter what our line of agriculture is, have upon the farm one or two acres of fruits so that the boys and the girls and the wife need not do without. But you say it takes too much time and trouble and, itemizing item by item the cost of the fruit as grown, it does not pay. Are you going to measure the health and happiness of our Illinois boys and girls by the money standard? Measured from the standpoint of what is saved the family in the year by way of doctor's bills, measured in the way of what has been done in uplifting the moral attitude of the boys and girls in the home, measured from the physical and intellectual standpoint it pays and pays well. Let my discussion lead your thought in that direction. Put upon the Illinois farms, fruit.

Fruit is not what we call a nutritive ration. Fruit is bulky and when we supply the table with a liberal quantity of fruit the amount of solid food is diminished that amount. As a people we eat too much food which is rich in all the essential food elements, but having with the same food something bulky and the dietry increased just that much the sugar and the acid in the fruit stimulate a better digestion, and for that reason any physician will tell you fruits are not luxuries but necessities upon our table and so let me close with this word. While you are stockmen, while you are corn growers and general farmers, you are first of all heads of families and as such it is your duty to provide the boys and girls on the farm with those things which will give them increased health and increased happiness.

All honor to the stockmen, all honor to the general farmer, all honor to the corn growers, who have been successful in breeding, in selecting and developing a high class of agriculture, but greater and more honor to the man who, in addition to these things gives to the home the health and the happiness which fruit alone can supply.

Mr. Wallace—If you had a quarter section of your own and wanted to raise fruit for a family, tell the people what you would plant, how many of each kind? I want the Illinois farmers to know.

Mr. Blair—Brother Wallace of Des Moines has asked a very important question. It is difficult to answer, but I will answer briefly as well as I can without having given it much thought for the moment.

Q. Please state the question.

Mr. Blair—The question is, what varieties and how shall the farmer of Illinois who has a quarter section of land grow fruit?

Mr. Wallace—The man must have a family.

Mr. Blair—Yes, a wife a whole lot of children.

Mr. Fursman—How many summer, how many fall and how many winter?

Mr. Blair—I am glad Brother Fursman is interested in the question. Take an acre of that land and devote it to the growing of apples, pears, peaches and plums, cherries and small fruits and some vegetables.

Select sixteen varieties of apples. Now remember, when I speak to you with reference to variety on your farms, I am thinking of a supply from the first to the last. I want something that the boys can eat; that they can go out in the daytime and pick. I want something that can be put away for the winter, and so I take sixteen varieties of apples.

Take two of the Duchess—one of the earliest and one of the best cooking apples we have; two trees of the Benona, a pretty good eating apple. There are two summer varieties. In this section the Wolf River apple. It is not grown very extensively, but for a fall apple on the farm it is a pretty good variety.

Q. How many?

Mr. Blair—Two trees. Put in two trees of the Famuse or Snow, which are a late fall variety; two trees of the Jonathan, so as to have some excellent fruit for Christmas. I mean for Christmas the Grimes Golden and two of the Jonathan for January. Am I not about right for this section? The Grimes Golden is one of the best Christmas apples we have for eating out of hand and cooking, too. The Jonathan is an excellent eating apple, tart and good for cooking, and can be grown anywhere in the State of Illinois.

What about late varieties? Something for winter variety. Since Professor Hedrick has spoken about the Ben Davis we will leave that out or buy it from the grocery store. We will put in the Minkler, it is one of the best winter varieties we have and the Wealthy, two trees of each of these.

Q. Wealthy for a late variety?

A. Yes.

Q. Is the Wolf River better than the Ben Davis?

A. I want a supply for the table right along through and the Wolf River comes in in the early fall.

Q. How about the winesap and the Ben Davis together?

A. Put in some Winesaps, probably one or two trees. It is a good keeping variety.

Mr. King—It is not good for this vicinity.

A. Better in western Illinois.

Q. How about Domino?

A. That is a pretty good apple.

Q. How about the Willow Twig?

A. It scabs badly and is subject to disease.

Q. How about the Roman Stem?

A. It is one of the best eating apples I know of.

Q. Huntsman Favorite?

A. I wouldn't grow it, because it rots.

Q. How about the Maiden Blush?

A. It is a good fall apple.

Q. How about the Bellflower?

A. You can't grow it. There are 2,500 varieties of apples. My point is this, to grow what you like and that your soil and conditions will take care of, but I want certain small fruits. I have 16 or 20 varieties. Put the balance in some Snyder blackberries and some Ancient Brittan, about 66 plants of each.

Q. Do you recommend the Ben Davis for southern Illinois.

A. If you want to sell in the spring. Put in 66 plants of that acre of Snyder, put in 44 plants each of the Grape and Kansas black rasberry. The Cuthbert is a good red variety. Then put in some gooseberries. The Downing.

Q. I like the Columbus?

A. It is a large variety and does pretty well on most farms, but do not forget the grape, eight or ten vines or one row.

Q. And some currants?

Q. How about the pears?

A. I will get back to them. Put in some of the Moore grape, the Concord and the Niagara, the first two are black ones. The Worden is one of the best grapes we have, some Niagaras which are white and the Woodruff Red, one vine that will please the children. If you want a brillant red grade, the Brighton.

Q. How about the plums?

A.—We will come to the plums.

Q. You will have to put on another acre?

Mr. Blair—All right. I wish the farmers really interested in this would write me at Champaign. Don't forget the report of the State Horticultural Society. You can get a list of varieties from that and the varieties are selected by special committee from the three horticultural districts in the State and those men comprising that committee have made a study of the needs of the farmer and the commercial man.

Q. Did you say the secretary of the Farmers' Institute or the secretary of Horticulture?

A. From the secretary of the district organization of the Horticultural society. You have right here in this town Mr. Phœnix and Mr. Foster and they will supply you. They will cost you $1 and it will be worth $5.

Mr. Blair—Let them spend five dollars and they will get the back numbers, and they will be sent every year.

Mr. Blair—What is the best variety of early pear you have?

A. Bartlett.

A. Flemish Beauty is a good early variety.

Mr. Blair—Put in the Bloodgood; it is a variety you don't hear much about, but I know it is a pretty good bearer.

Mr. Foster says Capers for late variety and the Sheldon. You can select hundreds of others that might do well.

In selecting the plums I don't know what to say. I think you had better take the native and the Japanese.

Q. How about the Damson?

A. It is pretty good, but they rot badly. The Wild Goose for the first one, and the Minor is a pretty good one.

Q. The Minor is late.

Mr. Blair—What about the Wolf plum?

A. It is good late plum.

You don't want many plums. They rot badly. If you select three or four trees, or five, I think it would be sufficient.

Now peaches: Put in some Champion and some Elbertas. I don't believe the farmer can afford to go beyond that, because in most years they will be winter-killed.

Now the strawberries: Put in some Haverly, put in some Bubaugh; some of the Crescent in some sections. The Dunlap is one of the latest introductions and one of the best from the farmer's standpoint. The McKinley is an excellent variety in Central Illinois. The Gardner in the southern part of the State is an excellent one.

Now, gentlemen, put these these things on the farm; prepare the ground. Before they are set out, take one boy in the family and say to him that that is his property to look after. Give him the literature and encourage him to look after it, and I will reiterate the statement that I made at the start—there is nothing on the farm that will do so much to improve the physical and intellectual and moral atmosphere of the farm home.

Mr. Wallace—How about the pumps that are to kill the insects in the orchard?

Mr. Blair—There are no class of people on earth that are so ready to be humbugged as the farmer with reference to buying cheap spraying machines, etc. Write to the secretary of the horticultural society in the district in which you live, get the information from him; write as a next resort to the State Experiment Station, and I hope we can help you. We are trying to keep in contact with the farmers of the State, because that is the way we learn your needs.

Q. The gentleman from Michigan, in speaking of the cultivation of the orchard, said that clover promoted the growth of bacteria. We have been taught here today that clover not only had bacteria, but there was bacteria for each kind of clover. Is there bacteria for each kind of apple tree?

A. No, I think not.

WEDNESDAY EVENING SESSION, 7:30 O'CLOCK.

Dean Davenport in the chair.

The exercises of the evening will be opened by music. I am informed that, owing to another engagement, the orchestra will play the two selections at the beginning of the meeting. We will, therefore listen to two selections of the Bloomington High School Orchestra No. 1.

The speaker of the evening needs no introduction to this audience, he is an expert teacher of the blind and has been interested in the teaching of agriculture in the schools for years. I have great plesure in introducing to you Dr. Frank H. Hall who will speak on "Teaching Agriculture in the Public Schools."

TEACHING AGRICULTURE IN THE PUBLIC SCHOOLS.

'Inapplicable knowledge is a cumbrous load; only the knowledge that subserves the ends of life becomes a working power."—Hegel.

"Beginnings that leave abandoned tracks in the brain because there is no relation to after life, are evil."—G. Stanley Hall.

All education is either useful or useless. If it is for use it is useful. If it is inapplicable to the things of life—not for use—it is useless. Education is useless, possibly harmful, if it does not increase one's power to contribute to the general good; for the measure of one's contribution is the measure of the man. All culture, therefore, should have for its ultimate aim, useful activity in the production of that which will supply some human need. Hence learning and culture should promote earning.

The word earning is here used in its broadest and best sense. He earns who, by the exercise of his mental or bodily powers, contributes to the good of some one else—to the good of his employer; to the good of the community in which he lives; to the good of the race. His contribution may relate to the material, the intellectual, the ethical, the aesthetic, or to the spiritual. If he contributes, he earns. If he does not contribute, he does not earn. If he contributes more than he consumes and destroys, he is a public benefactor. If he contributes less than is required for his own support, he is by so much a dead weight upon the community and upon the race. Hence to save ourselves from dead weights and parasites, if for no other reason, public school education should promote the earning power and the earning desire.

This power and desire are always promoted when the relation of the school work to the prospective life work is immediate and vital and when this relationship is easily apprehended by the learner. Much is lost if no such relation exists; or if, existing, it be remote and unimportant; and there is something of waste of energy if existing relations are not made apparent to the pupil himself. Hence the importance of such variety in school work as will appeal to all classes of prospective earners.

In response to the demands of practical people outside the teachers' profession and with the approval of large numbers of educators, practical and otherwise, science has at length been accorded a place in the schools. It is now on the same plane as literature and the classics. It was pushed in as it were from the outside because of its utilitarian value. It was reluctantly accepted on the inside because of its culture value. Manual training was treated in like manner, and now its real value, cultural and practical, are unquestioned. Commercial instruction was the next candidate for approval, and now, by business men on the one hand and by college presidents on the other, it is being escorted to a place of honor in the common schools. But what of agriculture and domestic science? A similar experience awaits them. Practical people are pushing from the outside because of the utility of these branches, while the educators are hunting for culture values. Since they are cultural as well as utilitarian their admission is assured. Both will contribute to the earning power of large classes of pupils, hence the public welfare demands that they be given a place in the curriculum.

The struggle between culture and utility for supremacy in educational philosophy, has well nigh ended. The contestants themselves are soon to accept coördinate places in educative aims. All desirable culture is for use, and utility is ever dependent upon culture. The practical is cultural and the cultural may be so selected that it becomes practical.

The demand for the teaching of agricultural science in the common schools is so wide spread and so urgent and its importance so apparent that the experiment will soon be made in this and adjoining states.

Says Sec. James Wilson, "We must not hope to educate agriculturalists if the study of subjects relating to their profession is delayed until the beginning of a college course. In the primary schools the rudiments of agriculture must be taught."

Says Governor Hoard, "I cannot bear to go to my grave until I see imparted to my nation this spirit that shall make agriculture not only the support of men's bodies but an inspiration to their intellects. I believe the key lies in the common school." Addressing a national body of farmers' institute instructors, he said, "I want you to move with irresistable force and power toward the employment of the common school for teaching the elements of agriculture."

Says Dr. A. C. True, director of the office of experiment stations, "The patrons of the schools, the farmers themselves should take an active part in this movement, impress upon the school men their real educational needs, and help to adjust the public schools to the advancing requirements of agriculture."

Says Prof. C. C. James, of the Ontario Department of Agriculture, "My own view is that taking the whole field of educational subjects from one end of the curriculum to the other, there is no other subject that is so full of life, so full of interest, so attractive, as agricultural science, particularly when handled by a man or a woman who understands the subject thoroughly and puts it in an interesting form."

Says President Harper: "Instruction in agriculture in the rural schools is an application of the now generally recognized principle of bringing the school work into close touch with the home life of the pupil; and it may safely be predicted that no more important application of the principle has yet been discovered. The nature of the subjects thus introduced, and their pedagogical possibilities, combine to make this step one of marked significance in the history of education."

Says Superintendent Charles R. Skinner of New York: "The necessity for instruction for our young people along the lines of agriculture and domestic economy is unquestioned. The difficulty at the present time is the lack of teachers themselves trained along the necessary lines."

Samuel T. Dutton says that the education of the past has been "too abstract and general and has not recognized the place vocation holds in the life of the individual and the nation." Again he says: "We have failed in arranging our educational courses to recognize one of the most vital factors in any civilized society, namely, vocation."

G. Stanley Hall says substantially that "the germs and educative extracts of as many trades and industries as possible" must be introduced into our public schools.

From the foregoing it will be apparent that some of the great educators are with us in the belief that the teacher should make apparent to the pupil the relation of the school work to his prospective life work; that education, in becoming practical, loses none of its culture value, and gains marvelously in its attractiveness for those who will use it; that the development of the desire and power to contribute to the general good should be the main purpose in educative effort.

Conceding that the next generation of farmers in Illinois ought to receive some special instruction in the elements of agriculture in the public schools—enough at least to make them familiar with what Dr. Bateman called "the matchless attractions of rural and industrial life"—enough to reveal to them the fact that there is opportunity on the farm for the exercise of brain as well as brawn; that genuine science is nowhere more helpful than in the tilling of the soil, in the culture of plants, and in the economic and humane management of farm animals—conceding that the time has come to take up this problem and vigorously proceed to its solution, what shall the State Farmers' Institute do about it?

As Superintendent Skinner has said, our teachers are unprepared fór this undertaking. It will be many years, if we begin tomorrow to work in good earnest, before the rank and file of the teachers in our rural schools will be really prepared to teach in the most elementary way the rudiments of agricultural science. What shall we do about it now? What is this body of representative farmers prepared to recommend and assist in accomplishing?

Permit me to offer the following for your consideration:

1. The teachers of this State should be required by law, after Jan. 1, 1904, to submit to a very simple examination in the elements of agricultural science. Failing in this examination, the license to teach should be withheld.

The result of such legislation would be to turn the attention of 26,000 teachers for a little time at least, to a subject to which they have hitherto given little thought. In no other way, it seems to me, could so much be accomplished in so short a time. Wisconsin already has such a law upon her statute books and her teachers are studying agriculture. This organization, a year ago, at Rockford, pronounced itself in favor of such legislation as might "result in the introduction into our public schools of the study of the elementary principles of agriculture." Let us see to it at once that our teachers begin to prepare themselves to do the work we are about to demand.

2. The State normal schools should offer such a course in agricultural science as will prepare their students for the proposed examination and for teaching this subject in an elementary way.

The farmers of Illinois have the right to demand immediate action of this kind on the part of the normal schools, to which demand, without doubt, cheerful response would be given. On this point I cannot do better than to quote from an address made by the late lamented Gov. Jno. R. Tanner at the dedication of the main building of the Eastern State Normal School at Charleston. He said: "My suggestion is that greater emphasis be put upon the teaching of the elements of agricultural science. Too long has this been neglected. Ours is pre-eminently an agricultural state. A main source of our wealth is our soil. It is the interest of the State as well as of the individual owner that its fertility be maintained. To do this it must be manured with brains. Our young people who are to become tillers of the soil must be so educated that they can read intelligently and appreciate the best literature of the farm, including the reports from the experiment stations as well as the practically scientific part of the best farm journals."

"These young people," he continues, "must be mainly reached through the country school houses. Are the teachers that are now going out from our Normal schools prepared to give instruction in these subjects? Have they been taught agricultural chemistry and vegetable physiology? It is explicitly stated in the acts providing for two of our Normal schools, and implied in the acts which make provision for three more, that instruction shall be given in the elements of agricultural science. Is this instruction being so given and so emphasized that prospective teachers become interested in the practical side of this subject?"

The farmers of Illinois are greatly indebted to Governor Tanner. He knew something of their needs. He was never silent when their interests were at stake. His influence as a man and as Governor was a factor of no mean importance in securing that appropriation by the General Assembly which has given to us the largest and most substantial building for collegiate agricultural education in the world. His address at Charleston was among his last public utterances. His plea for the training of teachers along agricultural lines should be reiterated in Normal School and Teachers' Institute and Farmers' Institute until this subject is given the prominence it deserves.

3. County superintendents of schools should be requested to devote at least one 40-minute period each day at every annual five day summer institute to instruction in agriculture.

By this means by far the larger number of the teachers now engaged in the rural school work could be reached promptly. While but little could be accomplished in so short a time, enough might be done to insure the inception of such instruction in the schools without delay. In addition to this, it would surely have the effect of bringing to the front a few teachers in each county who are by taste and training especially adapted to this kind of instruction. Later an exhibition of what such teachers accomplish would become an incentive to their co-workers all along the line.

4. The summer schools at the normal, at the State University and elsewhere, should give special prominence to agricultural science.

Here, much more could be accomplished than at the summer institutes. The latter are in session but a single week of five days, while the summer schools continue from four to six weeks.

To popularize and make effective this phase of the summer schools, two things are necessary:

First—Competent instructors must be secured.

Second—Those in attendance must be made to feel, by the necessary legislation if possible, that they will soon be required to prove themselves competent to give instruction in elementary agricultural science, if they retain their places as teachers in Illinois schools.

5. At the farmers' institute there should be at least one session in which the coöperation of the county superintendent of schools should be solicited, and through him the teachers and older pupils invited, and at which such subjects should be presented as will be of interest to them.

In this way the teachers will become familiar with the special educational needs of the farmer, and the farmers in turn will better understand some of the problems that confront the teacher.

A bond of sympathy and common interest will thus be developed that will be invaluable in working out the problem of agricultural education for those of the next generation who will actually till the soil.

6. The teachers and pupils of the public schools should be provided at public expense with "supplementary reading" and library volumes that have a distinctively agricultural bearing.

For supplementary reading of this kind, I most heartily commend the little leaflets published by C. M. Parker of Taylorville. They are: "The Study of Farm Crops," by Professor Shamel; "The Study of Farm Animals," by Dean Davenport; "The Study of Horticulture," by Professor Blair. There are 36 of these leaflets and they are sold at 1 cent each in quantities of 10 or more. They were prepared especially for school use by the very men upon whom you are calling for work in your institutes until they are taxed to the full limit of their strength. There can be no mistake in putting these leaflets into the hands of your children.

For the school library, I recommend without hesitation, the following: The Principles of Agriculture, Bailey; The Soil, King; The Fertility of the Land, Roberts; The Principles of Fruit-Growing, Bailey; Life on the Farm, Shepard; Clover Farming, Wallace; Feeds and Feeding, Henry; Chapters on Plant Life, Herrick; Uncle Henry's Letters to the Farm Boy, Wallace.

The sum of ten dollars would put all these books into the school library and procure a good supply of the leaflets for class use. Would not such expenditure be a profitable one?

7. Every public school in which there are pupils over 13 years of age should be put on the mailing list of the experiment station, and the bulletins, so far as their nature will permit, should become subjects for reading and study.

We are told that 500,000 farmers attended institutes in 1899. Nineteen remained at home for each one that was enrolled as a member of an institute! My own observation this winter leads me to the conviction that not more than one-tenth of those who attend institutes receive and read the bulletins from the experiment stations—one two-hundredths of the farmers availing themselves of the most reliable and valuable information bearing directly upon their business that can possibly be obtained! And this information offered without money and without price! What shall we do about it? Make the public school the connecting link between the farms and the experiment stations. Let the young people hear and carry to their homes the gospel of a better agriculture; the marvelously interesting and practical things that are being discovered and practiced at these institutions, the tendency of which is to emancipate the farmer from the serfdom of ignorance and prejudice. I can see no other way in which we can get immediate results commensurate with the discoveries that are being made.

8. Excursions of young people and their teachers to the University of Illinois, similar to those already made from four counties, should be encouraged, to the end that many may see for themselves what is being done at this institution that is of vital interest to prospective tillers of the soil.

The excursions already made were from Winnebago, McHenry, Sangamon and Christian counties. In Winnebago county, in part as a result of this visit to the Agricultural College, there is an organization known as the Winnebago Farmer Boys' Experiment Club. This club was organized Feb. 22, 1902, in the office of County Superintendent of Schools O. J. Kern. It began with 33 members, and it now has 180 names on its rolls. Each member has a set of the Shamel Leaflets, and the organization is in touch with the Agricultural College. Already plans have been made for another excursion to the source of their inspiration—Urbana. This second excursion from Winnebago county will be made on June 1, 1903, the railroad officials having given them a round-trip rate of $2.50.

Who can measure the value to the farming interests of Winnebago county in general, and to the boys of that county in particular, that will come through Superintendent Kern's successful efforts to bring the people of that county into closer relation with the College of Agriculture?

9. The influence of the members of this Institute should be actively enlisted in behalf of agricultural college extension, and they should assist in every possible manner the superintendent of that department of the State College, Fred. H. Rankin.

Superintendent Rankin has prepared circular letters, in which he outlines experimental work (studies in oats and corn) that will appeal to the interest of the intelligent and ambitious boys on the farm. He desires to communicate, through these letters and otherwise, with such boys and young men in all parts of Illinois. The officers and members of the county institutes can be of great assistance in carrying forward this important educational work. They should call the attention of the teachers to this department of the college, and see that communication is established between Superintendent Rankin and at least one boy in each school district.

10. The State University should give greater publicity to the fact that it offers through its summer school and to special students in its agricultural department, opportunity to acquire the knowledge and training necessary for the teachers of elementary agricultural science.

It is the conviction of the speaker that if a special "short course" in elementary science were offered at a time when those actually engaged in teaching could avail themselves of it large numbers would respond to the offer and great good would be accomplished. A practical, temporary, blending of the pedagogical and the agricultural departments of the University of Illinois in the interests of the rural schools would be greatly appreciated by those who have the welfare of these schools at heart.

It is quite possible that such elementary instruction may not be regarded as coming within the the province of a State University; but it is work that needs to be done, and no where else in the State of Illinois are there such facilities for its proper and immediate development. It presents a practically unoccupied field—an opportunity for "original research;" and honors await those who shall successfully perform this pioneer work. Later the State Normal Schools and the summer institutes may be able to more fully meet this new demand for guidance and instruction.

In conclusion, the times are ripe for a most important evolution in rural school education. Your State Superintendent of Public Instruction is a leader in this work. Realizing as he does that the city schools are well provided for in the matter of superintendents and skilled leadership, he has taken it upon himself more than any other State superintendent has ever done to bring the rural schools to a higher grade of efficiency. He is in close touch and hearty sympathy with the work of the farmers' institutes. Give him, I beseech you, your hearty support in his great undertaking. Give him all possible assistance in securing the legislation which he deems desirable. The consolidation of schools in sparsely settled districts, the free school for all pupils, the increase in the amount of the general school fund, are all measures looking to the interests of the pupils in the rural schools. If you are not already familiar with the proposed measures, investigate, and if you find them worthy, as I am sure you will, give them the benefit of your expressed opinion. Let the members of the General Assembly hear from you on these subjects. The united action of the members of the farmers' institutes of Illinois will secure the enactment of any law that ought to have a place on the statute books. With the enactment of the proposed laws and such modification of the course of study as will make the schools more nearly equally helpful to all classes of earners, the pupils will become more deeply interested in the work and will remain longer in the schools.

Says Professor Hyde of Bowdoin college, "The aim of education is to fit one for three things:

1. To earn one's living by the exercise of trained powers.

2. To support the institutions of society by intelligent appreciation of their worth.

3. To enjoy the products of art and of civilization through the cultivation of imagination.

This is exactly what we are pleading, namely, that the first effort in education shall be to prepare our young people to earn—to earn a living and more, so that they may be able to contribute to the support of the institutions of society, and in a condition to enjoy the products of art and of civilization through the cultivation of the imagination.

We have been taught that to think of vocation in school is narrowing in its effect. It may be or it may be quite the reverse. If thereby the pupil is induced to remain longer in a good school, the ultimate effect must be greater breadth and depth. But, better be narrow and deep, than broad and shallow. Better be narrow and efficient, than broad and useless. Better be narrow and earn a living and be able to contribute even a little to the good of the community, than to be broad and be a parasite.

Says President Woodrow Wilson of Princeton: "We want useful men, not men who have learning for learning's sake and who think they are better than others because they have something in their heads which is useless."

A distinguished journalist once said that if a man would practice on the piano six hours a day for 20 years, at the end of that time he would be either a pianist or a fool. Another journalist said he would be both. But he would not be so big a fool as the man who would spend 20 years in practicing upon 100 different instruments and at the end of that time be able to play only indifferently well on any one of them.

Education should enable a man to do something useful and do it well. Useful breadth and depth can be measured only in terms of efficiency.

There is a class of educated people in Germany whom Bismarck was wont to speak of as "beggar graduates." One of these cultured gentlemen once appeared at the home of an American resident of Berlin. He wore a silk hat and kid gloves and came to beg. "Why do you not work?" asked the common sense American. "That," was the indignant reply, "would not be in keeping with my social station."

The German government proposes to reduce the number of these useless men in the next generation, by offering only limited opportunities for higher education.

It would be untrue to say that we have very many "beggar graduates" in this country; but we do have men who are educated away from the kind of labor in which they would be most successful and most useful. Secretary James Wilson says, "The average mechanic earns more than the average professional"; and Doctor Harper says to his graduates, "You who are now entering the world will find that poverty will be the strongest opponent to overcome." We propose to modify and improve these conditions, not by limiting the number to be educated, but by educating for a greater variety of purposes. The American university is rapidly covering the entire field of activity. It remains for the high schools and the common schools to become feeders to these many sided institutions by the introduction of "the germs and educative extracts of as many trades and industries as possible." Among the industries to be thus represented in all the schools from the primary to the graduate work of the universities is what our friend Kerrick has aptly called, "Agriculture the Master Science."

A discussion of this subject will be continued and we will be led by Mr. Henry F. Thurston of Chicago.

Mr. Thurston—MR. CHAIRMAN, LADIES AND GENTLEMEN—I am asked to open the discussion of this question. Mr. Hall has discussed this matter from the standpoint of an educator, from the standpoint of a very successful teacher, now the few words I have to say will come from the standpoint of a school officer and I am glad there are so many here from the different counties. Now no question stands by itself. This question of teaching agriculture in the rural schools is directly made to solve other very important problems. One of these I expect to be the consolidation of the country schools.

Now there are in the State a good many country schools, that are so well developed that they could begin today the teaching of agriculture, but those schools are not the rule. They are the exception. We have in the State of Illinois more than 10,000 rural schools. How many of those schools do you suppose there are like Cottage Hill at Springfield? Very few. The greater number of our schools are poorly taught and poorly housed and we might say poorly officered.

I heard the superintendent of Wisconsin say last week that among the rural schools of that State not more than one out of 20 ever completed the course laid out for the rural schools. The children get discouraged and leave school long before that time.

Now, by the consolidation of the country schools, we bring about a change so that the children will remain in school several years longer and those extra year are the years they are learning most about agriculture. Now, by the consolidation of the country schools, we will stimulate the farms through the country schools.

The railroad communities have not the deep interest that the urban communities have. I was riding over near Elgin last fall and I came to a magnificent farm and barn that must have cost thousands of dollars. We got out to take a picture of the beautiful home and there was a little girl about 12 following us about. We spoke to her and asked her "Why didn't you go to school today?" "I am staying out to drive the truck wagon," was her reply. A farmer keeping the children out of school to drive the truck wagon and the school kept only six months in the year.

I was in Superintendent Bright's office last September and a young girl about 18 came in and said, "Mr. Bright, I have received no notice from the school board out in the country. I don't know when I am to begin." He said, "you go out and find out." She asked, "How many pupils are there?" and he replied about ten after you get started. "How many will I have to start with?" He said, "You may have two. I have known it to start with one in two or three weeks perhaps three or four." Now see the interest or lack of interest of that community in their schools. So I look upon the consolidation of country schools as being one of the essential things in the teaching of agriculture in the country schools. The subject does not say rural schools. I think it means the rural schools. I believe agriculture will be taught in the city schools and suburban schools before it is taught generally in the rural schools. In the city schools it will be taught as part of manual training because the children in the city have no way of exercising their muscle and brains except on their books.

In the city of Philadelphia they have already gone to work. They have gardens for the children in the public schools on a limited scale and it is found to accomplish some good.

I am not going to talk long now but I wish to speak of teaching agriculture and also in relation to the organization of school boards.

You would be surprised if I told you we have more than thirty thousand school officers. Just think what an army that is and what we could do through that army in the way of reform. There is only one county that has an organization of school officers and that is Cook and that is only about six weeks old. We have organized that association with altruistic purposes. We wish to bring the boards together. We have 32 boards of education in the county of Cook outside of Chicago, each one has seven members. You wouldn't suppose they had. We have 140 board of directors. You know a board of directors exists in school districts of less than one thousand inhabitants and when such number exceeds one thousand we have boards of education. We have 644 members of boards of education and boards of directors. In that we do not include the high schools board nor the board of trustees, of which there is one board of every township, and I wish to speak of this to-night because there are so many here from the different counties and especially those on school boards and I hope on going home they will begin to agitate for the organization of school boards.

In Illinois, with our system, one board will be doing a good thing and another board six miles away will know nothing about it. So last fall we started out to organize. The Winnetka board said I might use all the money I wanted. We sent out 300 letters to the boards of directors and boards of education and I wish to tell you what you have before you, it is difficult to organize school officers. How many do you suppose we got out? We got six persons. Three from the Winnetka board. I said we expected it and would go right along. We called another meeting and we got nine at that meeting, two from Winnetka and seven from others. We called another meeting and that time we got 18 and from that time it has grown steadily. We have seventy members from 21 boards of education and 15 boards of directors and two high school boards and you would be surprised to see the enthusiasm kindled by the association.

We will investigate the finances. The River Forest board wants an investigation of the board of assessors and we have to for the assessors have been catering to the politicians and selling the property for votes, In the River Forest district the only list of personal property owners consisted of three names and they were women and couldn't vote. You know this is the year when they are spreading the new valuation. The Maywood board has begun work and several others and we expect to get the boards in each county at work along this line. The work these boards are doing was done by the Winnetka board two years ago. We put a man in the assessor's office to make a copy of the taxes, of the assessed valuation and Mr. President I am talking this because it bears on teaching agriculture in the public schools. We got the list and spent 18 nights revaluing the whole district and instead of $400,000 worth of assessments we found we had $861,000 at a very conservative value. We went before the board of review and they said we can do nothing for two years but we will raise it $150,000 and they raised it and we put manual training, kindergarten music and drawing and domestic science and hired a teacher at $600. That is the result of a few night's work on our books. That is the work the boards are trying to do. As soon as we get that done we are going to take up another matter if the bill for the consolidation of country schools goes through we are going to begin a campaign of education in Cook county. The mere passage of the law will not effect very much. There are 18 states in the Union where they have the laws but they have done very little. I have written to other states and have received the printed matter of what they have done. We are going to carry the fight into the country districts and in Cook county we will work to place domestic science in the schools. I told you we had 32 boards of education in the

county not including Chicago and there are just three boards that have a domestic science department, the Winnetka, the Evanston and Oak Park. I think the rest will have it in two years.

If we can get the county organization and the board organizations throughout the State, we can revolutionize the educational problems. We will build up an organization that will be a great transmitter of electrical fire, but at the present time we can't reach along the line to carry such information as given us by Mr. Hall.

I have talked quite a while, and I won't say anything more on that.

One more point: the teaching of agriculture as related to the finances of the country districts. We talk a great deal about the country school—the little red school house, and we fancy that a little country school house is a poetical little thing; but if you look at it, it is a pretty poor excuse for a school, but the rural communities do not want to put money into their schools as a rule.

In our village we tax ourselves $2\frac{1}{2}$ per cent upon the assessed valuation for our schools. Of the 172 boards of education and boards of directors in Cook county there are only 29 that are assessed to the limit allowed them by the law. Of the 143 a great many could assess five times what they do and still be within the law. Mr. Bright told me some districts in the county men were actually elected not to spend money for the schools. He said there is one district where they only spend twenty cents on every assessed hundred dollars of value. Now you men understand that is twenty cents on every five hundred dollars of real value—that is, four cents on every hundred dollars.

Another man from another county said he knew where they didn't spend anything at all from the value of the real estate for the school, but depended on the railroad taxes.

I hope these three points will not be forgotten: That we must have consolicated country schools, or we can accomplish nothing in the way of education along the lines suggested here tonight; better and more organizations of school boards, and, finally, we must be able to learn to put our hands in our pockets and pay for what we want, because in this case, as in many others, we can't get something for nothing.

Chairman—We yet have a few minutes, and I am going to call on a few people for about a minute apiece. I haven't given them any notice. I see President David Felmley in the audience. I want to hear a word from him, if he will give it to us.

Mr. Felmley—I have heard Mr. Hall before, but I dropped in on my way from Springfield tonight to hear him again. He does not say anything stronger than the facts. You may have heard David Swing tell of the old lady who learned to say one expression in seven languages, and he thought it better to express seven thoughts in one language than one thought in seven languages. *Sine qui non.* You see I am using it.

You will remember, years ago, how Elihu Burritt was held up for all the boys to imitate, and why—because he had mastered thirteen languages. If he had known about iron and its characteristics; if he had known the different processes of reducing the iron from the ore; if he had known how the manufacturers used the iron, or what an army of workmen it took to make the Damascus blade, or if he had known the properties that make iron, the most useful of metals—the elements that give it its peculiar properties—if he had known all that, he would have been the learned blacksmith. And so, in this matter of agriculture, while we are teaching about everything else, I think we ought to teach things that will make us better farmers, give us a culture that will give us a love of the country—the culture that makes for delight in living when we feel the stimulus of it, and the culture that makes us the most useful in the world.

I remember of reading in the Tribune that what the country people need is to get to town; that they are perishing with dry rot. They must go where they can get the advantages of social life, where they can get ideas of dress and style. As a matter of fact it is not people who congregate in the barber shops that have the greatest acumen. The truth is if the man just sows and reaps he does not lead a narrow life, but if he does know something of his work of the mysteries in the air and the plants, if he knows of the mystery of the sunlight, the mystery of life and death, if he knows of the chemical agencies in the soil and the growing plant, the work of the bacteria, that is liberating and storing up the elements, if he can follow his crop to the market and knows the products of corn and sees that instead of being a land owner, he is marshaling the hosts of the universe and on his skill must depend the bread of nations.

The thing to keep before us first is how to illuminate the work of the farmer, how to let the light shine in. I was talking this matter over with the house committee and one member was ridiculing the whole thing of how we were going to teach farming in the schools. We can teach them why corn should be planted, the science that underlies the whole thing, the chemistry of the soil, its relation to growing plants, you can teach these things to children under 12 years of age and increasing it you will give them a start and interest them and they will be constant readers of these things.

I want to say one thing of the work of the institution. We began two years ago to do something in this line at Normal. We got a teacher to teach the natural sciences there so as to interest the teachers that come from the country schools and who will go back there. We began by establishing a course in the fall and spring in general nature study and in the winter the elementary work. Next year we will have two and one-half acres and we have employed a man who has been a farmer and we expect to do a good deal more than in the past. We expect all the children attending the model school of this institution to have some practical work of this kind. We must stimulate the instinctive love that children have for plant and flower and vegetable life. In the second place give them a knowledge of the process of vegetable life and the conditions upon which plant growth depends, and, third, we must give the child an opportunity to do the things that this knowledge promotes. That it is good to have an idea, but they must express it in action; and unless we can have an opportunity for the children to do something which will put into form these ideas it will not amount to much. We must have school gardens. In the school gardens we can have flowers and small fruits. We cannot give as much attention to the farm crops, but we do want to teach children how to propagate and care for as many kinds of flowers as possible.

While riding from Rushville to Beardstown with a friend we had some discussion about the flowers in the yards, and so we began to notice all the numerous farm houses, and in how many yards we found flowers, and there was not a single flower that had to be cared for by taking it up in winter—no tuberoses or bulbs; the flowers were iris and those that can stand much neglect. One of the things we will do as well as to make bigger stacks of grain upon the farm and better horses on the road and better cows in the herd is to surround our home with flowers and small fruits and make country life the more worth the living than it is.

Chairman—Director Thorne, I would like to hear just a word from him, if he will, from Ohio—two states to the east, that doubtless can give us something of their experience in this matter, at least something of their thought.

Mr. Thome—Mr. President, I have felt as I sat here this evening that we, in Ohio, where very much behind you. We have done something towards the consolidation of country schools. I believe it is the first step that must be taken towards any successful study of agrculture in the common schools. We are only at the beginning of that work, it seems to me, but that is the first step that must be taken because in the ordinary primary schools the difficulty is of getting teachers far enough advanced to understand the primary principles of agriculture. This difficulty is almost insurmountable. But the number able to teach it will be constantly increased. We have issued from Ohio two or three bulletins of nature study. I have been surprised that the call for this class of teachers come from the cities and not the country. The farmers in the country are not keeping up with their town cousins in this respect. I don't I have anything more to offer except to emphasize the point that consolidation is the first step necessary to carry out the program you have before you.

Chairman—I see Mr. Thompson of McHenry.

Mr. Thompson—Call on Mr. Pervier.

Mr. Pervier—I don't think I can add very much to what has been said on this subject already.

Mr. Thompson—You tell how years ago the country school teachers used to be men who received $50 and $60 and now they have girls that are paid $20.

Mr. Pervier—That is a very important point in connection with the school and whether we are going to have agriculture. If we are going to improve the conditions the first to be considered is the wages. The fact is, in my section of the country, we are not paying the teacher of the schools as much wages as the hired men upon the farm. We are not paying more than $20, $25 and $30 per month and expect to get good, competent teachers for the price, and the result is that the more able teachers are seeking some other employment and we must take the inferior ones.

Fifty dollars, $60 and $75 was paid to the country school teacher 25 years ago and they are doing in the country more of the graded work of the schools today. Now it is rare to find children in the country more than 16 years of age, they either go to town or not to school at all, and I believe the solving of the problem will be in the consolidation of the country schools whereby we may employ better teachers and create interest and I trust the Legislature will pass a bill to enable any number of townships to consolidate if they see fit. I believe we ought to use our influence with the members of the Legislature to secure the passage of that bill.

I have in mind an instance where two teachers applied for a country school in my neighborhood, one one wanted $30 and the other $25. I asked, who are you going to give it to, and they replied of course we shall give it to the one who will teach for the least money.

Q. Who were the men that taught 20 years ago?

Mr. Pervier—They were men working for an education and they went out and taught, but it is a rare instance now for them to teach in country schools because they can get better wages, and the result is it is most girls that are taking their places.

Q. What county?

A. Bureau.

Mr. Swigert—In Palmyra township, Lee county, they never paid less than $55 a month and they have a lady teacher, and no sooner was it agitated about agriculture in the schools than she purchased these pamphlets and she took it right up and is teaching it each year. She is paid $60 most of the time and she has been teaching the school for a long time.

Mr. Cunningham—I have the pleasure of being a director of the school that won the prize at Springfield this year. About ten years ago we were paying an inexperienced teacher $28, we are now paying the teacher $50 a month, and they tell me they are more willing to pay $50 instead of the $28 because they get something for their money. Our county offered a prize for the school that did the best work in agriculture work. Four schools were almost a tie and the one that won out was to be sent to the State fair and we won the prize at the State fair.

There are some people in the audience to-day that could read with benefit some of the papers both on agricultural work and domestic science from girls from 14 to 18 years of age. Some of you men could read the books with profit.

Mr. Abbott—I would like to hear from Dean Davenport on the centralization of schools.

Dean Davenport—You want to remember Mr. Cunningham lives in Eden. We can't compete with him.

There is only one side to the centralization of schools. It is cheaper to bring children together than to scatter them in a lot of places, that is because wagons are cheaper than school houses, drivers are cheaper than teachers and horses are cheaper than coal. There are thousands of schools in Michigan of less than four pupils, and it costs $200,000 to teach them and they cost twice as much as the most expensive city schools in that state. That is my opinion about this whole matter. Consolidation and transportation is good sense and nothing else is for these schools.

Q. I want to ask what county it is that was talked about?

A. Bureau county, good county but a bad neighborhood; $20, $25 and $30 a month and at the outside $40 a month is paid to men. Those are rare instances.

Mr. ————We have never paid a teacher less than $33 and that was an inexperienced teacher for the spring term, the highest $50 for an eight month's school and the poorest teacher we have ever had. Wages will not make the teacher.

Chairman—Professor Holden, a word.

Mr. Holden—I have listened with a great deal of interest to this magnificent paper presented by Mr. Hall and I am proud of the work that your president of the State normal is doing and especially proud that this State Farmer's Institute is taking up the question and I want to say that when such a body of men take up a matter of this kind for discussion there is something coming of it in the future.

We are told some of the best educators are coming to realize that there is as much culture and training in a beet root as there is in a Greek root and I think we agree with them. Many of the teachers will say we have nothing to teach. Professor Hall has spoken of the things prepared. I want to refer to a little experience of my own. It so happened that it was necessary for me to pay my own way through college and I taught during the winter and one day the question of rats was discussed. The study did not have any meaning, there was no lesson or moral except I was trying to find a little good out of the story and I said, "Just tell me how long the hair is on the rat's tail." They had it all the way from a half inch to two or three inches, and I said, "Can't you find out some way?" They said, yes we can go to the dictionary" and one little boy said "we can catch one." That was easier said than done, and they promised to catch one before Monday; then we had a discussion about the pupils of the cat's eyes and that led me to a great many other things, and we took the seed corn and we picked out what we thought we considered the best for seed and the people in the neighborhood commenced to bring their boys and girls to school and they had never visited before the whole term and they stayed a little while to see what we were doing with the corn and they would come to get them and we had more visitors and I didn't ask the other classes to study but it was confined to the little girls and boys of 10 to 15 and we had practical men come in and pick out which was the best and we had more interest and there is no way of getting the interest and keeping it than to apply your teaching to things about you.

We got to talking about strawberries, so that we found out the kind they had; and one little fellow said he had the Big Bud, but they didn't ever have any strawberries. I explained what the trouble was. What we want is not books. Get wide-awake, sensible teachers, and they will study the things out with the pupils, and they will test the seed corn and see whether it will grow or not, instead of just telling them; and the sooner we get at it the better.

Mr. Thompson—I am connected with the packing interests of this State. There was a time ten years ago when the animals we bought from the farmers were simply so much beef, mutton or pork. Today we can name the products of the meat by the hundreds. There are a great many of the products you are being asked to buy. I don't know what you know about buying them, but one thing is absolutely certain: the farm and agriculture is becoming one of the deepest studies. The coming generation must be educated, not only from the books, but concerning things for which they have to pay in dollars and cents.

We are making use of all the by-products of the animals, even the squeal of the hog, which we exhibited at the Paris Exhibition in the form of the graphophone.

In the science of feeding and breeding there is a great field for study. Much money will be spent in experimenting, but in the end we will become educated and save much time and money. In our work we look for graduates from the farm, and the other day we had to get an expert judge to take charge of the by-products. I speak of J. J. Ferguson, a classmate of mine, who is in charge of that department. The time has come, if a man expects to make his way in the world, that he has to understand the fundamental principles of his business. But I give you this advice: For God's sake don't send only one man from the community to your State University, because he will be the most lonesome man in the community when he gets back. I was afraid of being laughed at when I returned, and we debated at school the question of what we were going to do for wives. We were educated in our work, and we wanted educated women, and we debated the question, and not one of us went back to get the young women in the community where we were raised. We hope that will be changed. There are other things besides beef, mutton and pork you will have to study, and in the future only those who are "up to their job" will succeed.

Chairman—Mr. Carter.

Mr. Carter—I think the matter of teaching agriculture in the public schools is one of the most important things; but how are you going to do it? I wonder if you believe it ought to be done—that people ought to be taught in the schools the principles of agriculture? Why? Because you can hold up your heads and say you know something. Ten or fifteen years ago a man always wanted to say he grew up on the farm, and once a man said "I grew up between two rows of corn," and the fellow back in the corner said "A pumpkin, by gosh!"

When you get educated and come back to the farm and have a fine, magnificent farm I guarantee Professor Hall and Dean Davenport will go out to your farm and stay and talk to you all night if you can stand it, but if they let you do the talking they will learn a lot. Every farmer knows a good deal more than he thinks he does. There is nothing so green as the fellow from the city. Like the girl who lived in town and when she went out into the country where there were bars she didn't know any better than to climb over them. You have heard of the fellow that grew up in town and they had a white cow and when he went out in the country and saw another cow that was being milked he looked in the pail and said, "Does that red cow give white milk too?" I say there a lot of things on the farm that you want to teach the child. The things you know how to do. How to head off a hog. If it is wisdom, it is science. For their own self respect we want our children to know about the farm and we want to make it a study. It is as much culture to study nature as about Cicero or Cæsar and their wars. Grant's Memoirs are very much better. You will have your child struggle for three or four years to read through 12 books of Cæsar and in 12 months he could learn all about Grant and a good deal better fighting. We are wasting our time. We want the children to understand the facts that relate to the farm. It is education; the other is not education. You can't make me believe that God said "root hog or die." Make your living or starve and the doing of it is not education. It is the highest education and the only education that is education. Our Maker intended that we should be fed and well fed and healthy. That is our education. We won't get much in Illinois unless we work it out. My farm is worth more to me than a bank and it will remain for me and my children. We have the opportunity of the world.

We want agriculture in the Illinois schools. What is the trouble? I am going to talk more than a minute.

When I went to school we had a teacher with a nose as long as that. We used to write on slates and we used make a picture of him and that is the only picture I could ever make that was real good, I could laugh at it myself, and we wrote an epitath under it—

"My nose is long,
My ears are short,
I teach as I was taught."

That is what is the matter, our teachers can only teach as they were taught and they cannot do it any other way and it is hard for some people to get out of the ruts and the women can get out of them quicker than the men. Now, then, how do I know? I imagine a whole lot of it and the women can beat the men at getting out of the notion that the teacher must teach as she was taught. If they stand the children up and say, "Let me give you something to spell," or "I will give you some sums in arthmetic," you think he is a good teacher. That don't prove it. They are not good, but the teacher has to work to your idea.

Here is another thing. There is a State course of study and some man, a Mr. Parker, who publishes a set of questions, and they are sent out to the district schools and now every month, or every term, the children of the district must have an examination on these questions and at the end of the year another examination and the teachers have to teach as they are taught. Those are the things you will have to overcome. The examinations are to make them work.

Encourage the teachers to do as Mr. Hall has said. Let the teacher and children have thoughts and ideas. They will get enough arithmetic. Don't worry about that, but they don't know the other things. How are you going to get them? You have got to pay men like Professor Holden said and they don't work for $25 a month. I have had $75 a month for teaching and 18 miles to the nearest postoffice and we had every child in the district and there were seven or eight over age and three married people. I want to tell you a story. A fellow went out to a clothes dealer and for $3.50 he bought a coat, vest and pants and when he tried them on he found a whole line of bugs and he went back to the man and he said, "Look at this," and he looked at it and said, "I look at it." "Well, don't you see?" Yes, I see; what did you pay for it?" "$3.50." "$3.50, yes; what did you think you would get? Humming birds?" You can't buy them for nothing. They cost money. Now you will have to pay for this kind of education. It may be a man or a woman but your children are worth it. People who are taught are worth more than the other people. It is not too much.

You must have better teachers and you must have a law to bring it into effect. Look at the work of the W. C. T. U. in this State, 43 states of the United States now are teaching physiology in their schools, and that physiology must tell of narcotics and their effect upon the human system. I don't dare to leave it out because every member of my school board is liable to a fine of $25 where it is not done, and I am afraid they would haul up the board and catch me too. Now you see it can be done.

We have another example, about 30 years ago it was decided we should teach science in the schools and a law was passed that all the teachers who wanted a first grade certificate must pass an examination in those things and the county superintendent began to prepare the teachers. If you want it ask for it. Let it be put into a law, then the teachers will be found. Professor Felmley will provide the teachers. He is the person who hears these things discussed at the State Teacher's Association. It is only just a little time until it is coming. The normal schools are all right but they need your help. Professor Felmley has been down talking to the Legislators. You can help him by waiting on your Representative and your Senators. We want to have the normal schools helped in this matter. Let us tell the Legislators to give him $20,000 and to the other schools as much if they need it. They are turning out lots of teachers and the State university is doing all it can, but if we want agriculture taught where it will do the most good we must have it taught in the schools.

Chairman—Just a moment—the secretary has a word to say.

Mr. Hostetter—In connection with this subject and asking for legislation don't let us put it for the rural schools but the public schools.

You are now adjourned.

THURSDAY MORNING SESSION, 9:30.

J. H. Coolidge, presiding.

Chairman—We will open our exercises by an invocation by Doctor Scott of Bloomington. Will the institute please rise.

God Our Father who art in heaven we come into this assembly this morning looking unto Thee. We acknowledge Thee in all our ways. Thou hast made the sun, the land, the farms and the cattle upon the thousand hills. The summer, the winter and the heat and cold and all the blessings that we enjoy come from Thee, and we thank Thee our Father for the good things with which Thou hast blest us, for the great agricultural interests in this country. These men have come together from all parts of the State to study agricultural interests in order to develop them and make them better and better. We pray for thy blessing upon all the farmers and their interests in this great State of ours. And not only bless them in temporal things but in spiritual things and be with them in the home life and social and intellectual life and may it be that these interests shall materially grow. And we pray our Father that Thou will help all those who belong to our State to stand together for the improvement of the State. This we pray in the name of Jesus Christ our Saviour. Amen.

Chairman—I find on this table a very beautiful gavel presented by the S. R. White Manufacturing Company of Bloomington. I wish to express the thanks of the farmers' institute to the S. R. White Manufacturing Company for their present. I should have appreciated it a little more if it had come a little earlier.

My former gavel was a 3 cent cast iron hammer and I am proud of this one and I am going to take it home as a souvenir.

We will commence our program with a talk on Breeding Corn for Special Purposes. Now, Professor Holden is from Ames, Iowa, but

I don't want you fellows to forget that all he knows about corn he learned here in Illinois. We had to send him over to teach the Iowans how to raise corn, how to select corn and how to breed corn.

Professor Holden—Mr. President, members of the Illinois Farmers' Institute, I want to assure you that it gives me very great pleasure, indeed, to be with you to discuss this subject and I want to say at the outset I have not come here with the idea that corn is the only thing in the world nor do I think it is the most important thing to be discussed at a meeting of this kind. If there is one thing that is vital to us it the training and education of our children in our homes, and if we would stop to think for just one moment every one of us would give every foot of land we own, every dollar of our bank account rather than see a boy or girl of ours go wrong. We well realize that in talking about hogs, corn and cattle that we are not touching the most vital question to this great country of ours. It is good citizenship we need more than anything else.

It is not with the hope of bringing anything new before you or that you have not heard Mr. Samuel discuss, and many of you have heard me talk before at different institutes, my only hope is in talking to you that I may be carrying a message to the people of your communites all over the State, and I want to say that if the things I will attempt to make clear were followed and practiced by every person in the State of Illinois it would increase the yield of corn not less than five bushels to the acre. The fact is, as Mr. Funk brought out in the discussion it seems impossible that when this corn lies so fundamentally at the base of our prosperity in this central west that we should have paid in the past so little attention to it. And it is true. We have studied cattle, we have bred cattle and paid very little attention to our corn, the one thing that lies so fundamentally to prosperity not only of agriculture but of every industry. I met a traveling man in the depot and he said "Mr. Holden, I am going to lose my job in a few days," and he said "do you know the frost got the corn in the northern part of Iowa and farmers are not buying the shoes they used to buy and I am going to be out of a job." Every industry, every enterprise in this State is built upon this great corn crop and while we have looked at corn we supposed we were studying corn, but we have been looking at it and not studying. I am sorry to say this but it is true.

There are only a few points that I can hope to bring out this morning. The topic on the program is a little misleading because I had no idea of discussing the breeding of corn for special purposes. I would like to discuss the subject for you but your corn breeders have done so much for you in this State, and I want to say the result of the work on the charts is the result of the work I did in the State of Illinois and I am simply bringing it back to you in the hope of making some points clear and I want to say also that a great deal of it has come from the Funk Bros. Seed Company, a company which has undertaken to study out these things in the scientific breeding of corn and there is great credit due them and a great deal of this work was dene right here in this very town in this community and the analysis I will give you of the corn was done here in the chemical laboratory, although I have been carrying on the work in Iowa. There are three or four points I want to bring out and they are things you must do between now and planting time that will enable us to grow a few more bushels of corn. It is not in your power or mine to become corn breeders at once. If we start out with the very best herd of cattle in the State of Illinois, unless we knew something about it, because of lack of experience in ten years we would run them out. Just so if we start with the best corn in the State if we were unable to keep it up in a very few years we will be further back than ever.

It is better to get our corn from firms like Funk Bros. or individuals like Reid or Grout and have them breed corn for the people. We might breed corn for six or seven years and then the frost will catch us once and we are out, but we can do something with the corn every year that is important. Before I get to the selection of the corn I want to call attention to the point that was brought out in the class room and I want to agree with the statement made there, but as there are many more people here I wish to repeat it. Through our State and this great center west there has been developed a great interest in corn and the tendency of the farmers to write to the experiment stations and they become convinced there must be something in this talk and they send off to some seedsman and get an ear of corn. There is just one ultimate result of that. It is disappointment and disaster. And let me call your attention to really where the disappointment must lay. You get a bushel of corn and pay $2 for it. It is not what you pay for it but it will raise 400 bushels at least and it will disappoint us 19 times out of 20. Hundreds of times it will prove an entire failure and we lost not simply the $2 but the $125 or $160 that we ought to have had in return for our labor, work and trouble and our land. That is where the great loss comes in and I want to say to you that that condition is brought about by changing corn from one latitude to another. There are one or two things I will discuss. In the center of the great corn belt that reaches through here North and south 40 or 50 miles is the one locality on the face of the earth that is best adapted to the growing of perfect corn. We will find south it grows to stalks and small ears, north you find your stalk getting smaller and your ear larger in proportion and it is a very little distance from north to south. If you are living in the north teir of counties of this State it will be necessary for you to get some corn from the county south in a few years and take it north. Just so the corn you send to Iowa it is not half as long as it was when it came from the State and the constant action and environment of the climate has shortened the kernels. I don't mean that you are to buy all your corn. It would be most unbusinesslike to buy the corn for your entire farm this year from away, but whenever the time comes that we fix our interest, our attention and our brains on the corn then it will be unnecessary for us to talk about corn. You will then find out more about corn in a few days than it is possible for me to tell you in the minutes I have here. To find out if there is any variety better than the corn you now have, buy a bushel or a half bushel and distribute it among your neighbors and try it thoroughly and don't expect the best results the first year. If there is anything better you ought to have it in every community. You people represent a good many communities and you ought to pick out some man in that community who is a corn crank as one man said, and you want to buy your corn from him and let him do the breeding for you. We can go farther east than west to buy our corn for seed.

We have had so many experiences in Iowa that we feel like saying "Let us husk our own corn for improved seed." We must buy our seed corn in the ear. The Illinois Corn Breeders' Association has been the first organization to take a stand in this matter, and it has done wonderful things for the whole country—not simply for Illinois, but the whole country; and we are trying to induce our people to adopt similar methods over there. You buy your corn shelled, and need not be disappointed in what you get. I want to say to some of you people that it is a fact that some corn which you have purchased the probability is it is not as good corn as you could get by going out to your own crib and with a scoop shovel get your seed corn. Some seedmen in Iowa buy their corn at two or three cents above the market price, and they go to the crib and get it with a scoop-shovel, and it is shelled, screened and and sold to you and I and others in the country for $1.50 a bushel, and the result is great disappointment.

Some of you spoke of getting corn from the north, and it kept growing and not ripening. That corn was probably shipped in car-load lots to the seedsmen, and you were still north of where that corn was grown. You have no idea of the hundreds of thousands of dollars made by fraudulent seedsmen, and I want you to help us in your community. I want you to advocate the buying of seed corn only in the ear, and return it if it comes in any other condition.

The second point, and the one to me that is of the greatest importance of anything I shall present to you—and I wish I could emphasize it and make it ten times as strong as it is possible for me to say—is the question of getting our corn and our planter and our brains together. It is something we have not done. We go out in the spring when it is time for the crop to be in and pick up an ear of corn and put it in the planter, and test it a little, and hitch the team on and say "All right, John." The corn comes from hundreds of ears, and that is no test of the planter, and I will say that in the careful study I have made of corn in the state of Iowa last year there was not more than 75 per cent of a stand of corn, and I don't believe it would exceed that very much in the State of Illinois, because I, for three years, was over a large section of the central part of the State and saw a great many fields of corn, and I think, on an average, 75 per cent of the stand would be as much as you would have in the State. Think of that—what that means to us and our farmers and the State of Illinois! Putting in our time and labor, and getting for the time and labor three fourths of a stand of corn, and sometimes less than this. One thing that will help this greatly is to get the corn and planter together and see what it will drop. It should be done now, before the 20th of March. The work will be slight compared with the possibility of 700 bushels, worth $250. How little is a day or two of work on a bushel of corn compared with the results of good business management of our farms. We could afford to put a week on our corn at this time of the year. We can do it evenings and when the boys and girls are around the home. It will be a good thing for them.

The important thing in connection with this I would just like to state is to get the corn that has uniform grains, that is kernels of corn of the same size, same length and the same shape in every way so the planters will actually drop the numbers we want. In the two ears of corn one is very wide in the kernel and the other narrow. I have been at some of our large farms and seen the corn they had sorted out for seed and here are two of the ears of corn, one ear of corn has 10 rows and 40 kernels in the row and here is another with larger kernel that has two rows more and fully 1,000 kernels on it. We are in the habit of putting them in together and putting them into the planter. There are thousands and hundreds of thousands that have done it. It is impossible to get a stand with that kind of corn and I want to show you the test we have been making for the last four weeks in selecting the seed corn. I will go through the method we went through at Funk's and resulted in a great increase in the corn acerage on the farm.

We picked out about 50 ears of corn and we must do these things if we get the best results. About 50 or 100 ears and arrange them on the table with plenty of light and looked them over and pushed out those that were too big or too small or too rough or anything that we can see from the outside. Here is an ear of corn that is pretty good but on the one side the kernels are wedged in and very narrow and small and it is simply impossible to plant that corn and get an even stand so it is pushed out and out of the 50 or 100 there should not be more than 10 or 15 or less than that. Up to this time you have all done well but that is as far as you went. Take out two or three kernels and lay them down on the table right in front of the ear with the top towards you and with the germ side up, and I will show you the reason for the germ side up. Go right through with all that is left and take out the kernels and lay them down and you will see things in the corn you never saw before. As I go through the corn here I find some of them with broad kernels like this and I find other ears just as perfect and just as good which you would think you could not afford to throw away yet when the kernel is taken out the kernel is not more than half as large.

Here is a chart that was made last Friday from a photograph. These are all photographs made from samples of corn. Here is a small kernel and a broad one. They do not show on the chart as they really show when you examine them. Others are pointed and narrow of all shapes and sizes just as they came from the ears of corn. This row on the further side is corn from samples picked out that will do to plant. That corn will drop regularly while on this side it is just as they were taken out of the cob. The crop was only about 74 out of 100. It is impossible to get it better than this. As we look further we see some ears of corn while perfect on the outside (all the corn on here was from good splendid ears of corn) when we took the kernel out we find some were long slim kernels like this, others not half as long and here is one that is about normal, in other words the planter will drop two every time it will drop one of these. You can't depend on the planter to drop them evenly. It will drop these for a long time and then these, you have got to try your planter and find out. Here is another chart, the ear on this side, the kernels are uniform in length from the top to the butt of the kernel, but these are not half as long and the planter would drop them like wheat. It would drop seven or eight and nine kernels to the hill.

It is just such an ear as you would look at and say "What a fine ear for seed purposes."

There is another thing to be looked at when we get the kernels out. You will notice here are four kernels, and this kernel here is this kernel turned edgewise and photographed, and this one is this one turned edgewise and photographed. That kernel is very full and plump. They are nearly identical in shape, but this one is thick and the planter will average two of this one while only one of this, and the same with these kernels here; and it is important they should have this shape.

One of the most important points to notice when we take this corn out is the shape of these kernels. Now often-times here is an ear that looks very nice, and we often find a kernel pointed in shape when we take them out. That row of corn was taken from this ear—just a row of eleven kernels taken out, and we took out eleven kernels from this ear. You see the open space next to the cob. It is weak in germination and low in feeding value. See the great amount of open space, while these are firm and solid clear down next to the top. Those ears should be thrown out, and we can't see that unless we get into the corn. The ears may look equally as good on the outside.

Now here again we find forms of kernels. It is the worst of kernels. It is weak in vitality. They have a weak germination. Here is the worst form I think we can have. This kernel, with this shape, just as we found it in every exhibit in Iowa. Simply caused by no attention having been paid to the selection of the kernel.

Here are some the exact shape I like to see as they lay on the table, full and plump next to the tip. Now there are some other points we have to notice as we go through this. As we look at the outside of this ear of corn it looks firm and solid, and I would say. without any hesitation, that it is a good ear of corn; but we take the kernels out and look at it, the germ has blackened and will not grow. You can see that, and here are some of the things we should see in regard to the kernel. Wherever you have kernels of corn that are broken, as you see it here, put them aside, as they have been injured in some way. Here is another in which the chaff is attached to the point of it, and when part of the cob comes off with the kernels the ears are diseased or undeveloped in some way and should be thrown out. Where the little tip has been broken off and exposes the germ, they will fail to give us a good stand, as it is immature in some way. The horny tip is not covered in this, and in good seed the horny part should be clear and bright. Where it is shrunken it shows it has not ripened.

Now after this has been done—after we have gone through all the ears and throw out for all the things we could not see from the outside—there will be very few of the first fifty or a hundred left. There are so many things. It is as difficult to pick up a perfect ear as a perfect man or woman, and that has not been done yet. When they get very many of them there will be no use of corn breeders.

I was on the train the other day with a board of trade man from Chicago, and he said these farmers are making a big mistake in shelling off the butts and tips, and I want to take steps to correct the evil. You must shell off the butts and tips and throw out ears with irregular rows. You can't make your planter drop an even number to the hill if you put in the butts and tips, and they are slow in germination. Over and over again I am asked if we shell off the butts and butts and tips, if after a while we won't have any butts or tips.

Q. It does not change the form of the ear?

A. No, sir. The kernel has all the characteristics of the ear you took it from.

Q. It evens up the dropping part?

A. Yes.

Q. Are there are not planters made to correct that?

A. Yes, sir. We have been testing the different kinds of planters. There are certain kinds of planters to-day if used throughout the state of Iowa would make a difference of $1,000,000 and more in the corn crop.

Q. Is it the planters with more plates. The planters that have more plates of different size?

A. Yes, sir. Don't forget the question; we will take it up later on. Thank you for waiting for it.

Here is the test we made of the butts and tips to see what the results were in regard to the germination of the butts and tips of the corn, to see whether or not it was just as good to plaat as the middles. We made a test here of 500 kernels. This 500 taken from 20 different ears of corn, 500 from the butts and from the middle and from the tips. It took 73 hours for 19 of the butts to germinate, of the middles 80.6 of the top 37; at the end of four days 50-87-67 120 hours or five days 74-92-72, six days 83-94-84. That is the average of a large number of tests. They are so large and thick in the kernel and do not take up the moisture and come on after the others. They are at a disadvantage with others.

Here is a test of a whole ear of corn to show what the result will be if we attempt to plant the ear as it is:

No. of kernels. (Per cent in 100 drops.)	All kernels. (Per cent in 100 drops.)	Middle kernels. (Per cent in 100 drops.)	Tip and butt kernels. (Per cent in 100 drops.)
0	0	0	3
1	1	......	14
2	6	8	30
3	66	92	48
4	25	......	5
5	1	......	......
5	1	......	......

The composite test of ears of corn thus shows kernels irregular as compared with those that are regular.

No. of kernels. (Per cent on 100 drops.)	Kernels in regular rows on cobs. (Per cent on 100 drops.)	Kernels on irregular rows on cobs. (Per cent on 100 drops.)
1	0	1
2	2	5
3	85	84
4	13	10

The three kernel to a hill is dropped with much the greatest regularity.

Here is another test of the butts and tips and the middles with regular and irregular kernels.

No. of kernels.	Very irregular kernels on ear, butts and tips off.	Regular kernels in—	
		a	b
1	6	1	......
2	19	11	8
3	74	87	92
4	1	......	......

Here is a composite test of the corn shelled together from 20 ears.

No. of kernels.	Butt kernels.	Middle kernels.	Tip kernels.
1	5	2	......
2	30	2	2
3	62	95	22
4	2	1	39
5	1	......	22
6	......	......	11
7	......	......	4

I want to say to you and I want to say it as emphatically as I can that you must introduce the corn to the planter after it is shelled. Take the planter and bring it into the kitchen if necessary and set it up and raise one wheel on a block and turn it just about the same as it would move in the field and put our corn in there and test it and we should stay with it until it has been tested until it drops at least 95 times out of 100 the number of kernels you want.

Q. Is the motion test the same as the field test.

A. Yes, sir.

That planter wants to be tested thoroughly and stay with it until it gives you the test you want, then take the planter out to the barn and use the same corn and hitch your horses on and drive it across the barn floor and see what it does. Then go and follow the planter into the field and see what it is doing. After we have made a careful study and paid so much attention to the corn it is important that we get a stand of corn and that is the thing to do, but if you can get it so it will drop the corn in your house I guarantee you won't have much trouble about the stand of corn.

Q. After you have taken off the butts and tips wouldn't it do to run it through a screen?

A. We have been experimenting with screening and it does not amount to very much.

Now do'nt shell this corn altogether. You have the butts and tips shelled off and now the thing to do is to shell our ear of corn by itself and when it is shelled put it on the screen and examine it and if we find here some of the kernels are broken in this way or mouldy or broken off at the tip throw it aside, if it had been shelled in with the rest it would have simply meant two days' labor to have picked all those kernels out and you would not get them all out. If you let them go in they will give you nothing in return. That is an important point.

Don't wait to shell all your corn, take the first peck or half bushel and take it to the planter, that is the final test, and see what it will do. Then you will have to look at the corn after it is shelled and examine it and you will find a great many discolored spots and poor seed all mixed in and they must be taken out. There is no other way and you must sit down and live with it until it is picked out by hand. There may be 700 bushels. You must spend time with it if you want the best results and we must have the best results. Pick out the kernels that won't grow and keep a picking.

In testing your planter, a Deering planter is a sure one, and the Black Hawk with a rim drop, where the kernel drops into the slot one kernel at a time and then three is dropped at once is not the planter we want. We want it to test 96, 97 and 98 times out of 100 to drop the number of kernels we want. I will just say right here I would try to set my planter to drop three kernels to the hill and the further north the more kernels to the hill and the further south the less kernels to the hill. Test it yourself, put in a strip with two kernels to the hill and another with three kernels and wait and see whether you get more from the three or two and from the four and you may change your mind in regard to the number best to plant; try it on the scales. I feel certain that we are not planting quite enough corn because we go through the field and find our fields of corn average 2.60 of a stand to the hill. In the state of Iowa there is 6 per cent missing hills throughout the state, that mean 6 per cent. That is a pretty good interest on the investment. We can't afford to lose 13 or 14 per cent with only one stalk. For one stalk does not produce a good ear as you will find. It is lonesome and don't do as well.

It is necessary to know the corn will grow, so there should be another test about the 20th of April and I know of nothing better in the way of a tester than such a little box as this. You can study the corn this way and see just what it is doing. If you put it in the soil you can't see until it comes up and we can't see whether the kernels are growing evenly. It is one thing to have it grow and another to have it grow with vigor, strength and vitality. You can see and examine it carefully and at the end of six days if there has not from 93 to 97 sprouted it ought not to be used for seed purposes. In order to get a fair sample about 100 kernels should be taken from each sack in which the seed is placed, run your hand down in and take them out that way.

Use a cigar box, and I don't know any better use to which a cigar box can be put, and I take a newspaper and put in four or five thicknesses and Mr. Carter says it is the best use to which a newspaper can be put, and wet the paper and take 40 or 50 kernels and put them in the center and fold the paper over and lay another piece of moistened paper on it and set it in the sitting room, and keep the papers moist and at the end of the four days they must have sprouted and you can very readily tell the condition of your seed, but I must close.

The points I make are these: First, depend on the home-grown seed; second, bring the corn and planter together, and stay with them.

If you have corn you can afford to fairly test the planter. I should certainly feel that my time had been in part wasted if I did not feel that by the testing of this corn we are going to get a stand, and that you will carry out the suggestions in a good many parts of Illinois, and I would not have come here to talk to you if I did not consider this important.

Mr. Black—Is it not wise to gather all your seed corn before cold weather, making a selection from the stalk? Is not corn so selected more sure to grow and have greater fertility than that ripened on the stalk?

Mr. Holden—No, sir. My experience has taught me that there is no place so natural for the ear of corn to finish its growth as on the stalk. The ear would make a less test.

Mr. ———About gathering corn in the field: I have been a farmer for 22 years, and for 21 years I have dried my corn in the kitchen, and I always have a good stand.

One thing I forgot to say was my reason for laying the kernel with the germ side side up. The feeding value of the kernel is in the germ, which is the very richest part of the kernel. From numerous tests I have made for Funk Brothers and tests in Iowa, it has been shown that the germ has about 55 per cent of oil and has also about 19 per cent of protein. We find the kernels with the large germ from 1 to 2 per cent more feeding value. In the lower part of this kernel of corn I find in the lower section 12.31 per cent of protein and 12.15 of oil, and the middle is less. We have a little more protein in the crown or top and the oil is much less. So we find the richest part of the kernel is the germ, and the crown the next in protein—that contains 13.55 per cent of the average protein, while the average of the kernel would be quite a little less than that; and the next richest is the horny part, and the poorest is the flour part around the germ; it is low in oil and protein. It is one of the things we must do—pay attention to the things that mean a higher feeding value.

Chairman—I am sorry we can have no more discussion on this. If I had the arrangement of the program I should give a whole day to nearly every topic we have and give a thirty-day meeting. We must give Prof. Mumford of Missouri time to demonstrate what he knows. He did not study in Illinois.

GRASSES AND FORAGE PLANTS.

The subject which has been assigned to me is a very broad one which might be expanded to include almost every crop grown on the American farm. I will, however, hasten to assure you that I propose to limit what I have to say to a compartively restricted field. Instead of including all plants belonging to the botanical order graminae I shall consider grasses as here used to apply solely to such plants as the ordinary farmer has in mind as furnishing us our pasture and hay crops. What I have to say on grasses will apply principally to pasture grasses, and the maintenance of pastures.

In connection with the division of my subject which applies to forage plants, I shall speak particularly of leguminous hay crops and pasture plants not included under grasses. In the course of the discussion I hope to be able to show some reasons why we ought to give more careful and sytematic attention to our pasture and hay crops.

We cannot separate this discussion wholly from its relation to animal husbandry. America is a live stock country. Our country is not noted as the home of skillful cultivators of the soil. We suffer in comparison with almost any other civilized county of the earth when our methods of cultivation and their results on soil fertility form the basis for such comparisons. The people of Holland starting with the thinnest sort of washed sea sand, almost destitute of any elements of soil fertility, hold today the record for having produced the largest average product per acre of any country in the world. Their success will forever remain a monument their to skill and persevering industry. Germany has done more than any other country to systematize our knowledge of fertilizers, and the German farmer everywhere is recognized as a skillful cultivator. Even Switzerland, whose farmers cling to the steep mountain sides, subject to snowslides, avalanches and hail storms, produces an amount of hay per acre on the barren slopes which would put to shame the efforts of many a good farmer of the new world.

But the American farmer is renowned as a successful breeder and feeder of live stock. With possibly one exception only, America contains today more skillful breeders and handlers of live stock than any modern nation. We have not only succeeded in maintaining and improving the established breeds of the Old World, but the standard bred horse, the Merino sheep, the Poland China and Duroc Jersey swine all attest our ability and justify our claim to distinction as a live stock country. Our agricultural colleges and experiment stations have devoted more attention to instruction and investigation in animal husbandry than perhaps any other one line.

I am glad that we, as a people, are unalterably committed to a policy so fundamentally important in the development of our agricultual resources. Improved live stoch means an intelligent agriculture. The live stock business compels interchange of thought. From an economical standpoint attention to animal husbandry means conservation of soil fertility and hence a permanently prosperous agriculture.

I do not here wish to deal in commonplaces, nor attempt to consume your time in telling you too many facts you already know, but I cannot resist the temptation to present to you some reliable figures on the comparative results of stock farming and grain farming as determined by Prof. H. Snyder of Minnesota.* This investigation showed that continuous grain farming on a 160 acre farm resulted in a loss of 5,600 pounds of nitrogen, 2,500 pounds of phosphoric acid and 4,200 pounds of potash annually. Stock farming on the other hand showed a loss of only 800 pounds of nitrogen, no loss whatever of phosphoric acid and a loss of 85 pounds of potash. The practice of continuous grain farming resulted in extracting chemical elements of soil fertility, which estimated at market prices would bring $1059.75 more than the same elements removed from the same area by stock farming.

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*Bulletin 43 Minnesota Station.

Successful stock farming is impossible in a country destitute of pasture grasses and forage plants. It is equally true that, other things being equal, that section which looks well to its pastures and winter forage will be pre-eminent in a nation already honored as a live stock country.

PASTURES IN THE CENTRAL WEST.

We have never yet, as a people, valued high enough our permanent pastures. The average pasture does not produce one-half of what it ought to produce under rational methods of handling. It is not surprising, therefore, that in the central west we have come to regard our land as too valuable for permanent pastures. The majority of farmers have never possessed a thoroughly good permanent pasture, and therefore base their conclusions on pastures which are admittedly less profitable than would be the same area devoted to cultivated crops. A good pasture is one seeded to the right kind of mixed grasses, every square foot of which is well covered with useful herbage, and not weeds.

The basis for every good permanent pasture is Kentucky blue grass. Many sections in the central west will quickly produce a blue grass sod if left uncultivated. It is not, however, generally profitable on high-priced land to depend on this method for securing a permanent pasture. By this practice many bare spots will remain fer several years, which are not only objectionable because they materially diminish the yield, but also because they give opportunity for noxious weeds to grow. It is better, therefore, to sow blue grass seed at the rate of about 14 pounds per acre on perfectly prepared land. A dressing of barnyard manure will insure a good set of grass if other conditions are favorable.

The greatest difficulty in seeding to blue grass is in securing good seed of strong vitality. We have had so much trouble in this respect that we have been compelled to strip our own seed and apply when possible at once, before curing. The commercial seed is secured by stripping the seed and curing it by placing in small piles or on drying floors. This curing process often destroys the vitality of the seed, and when sown the results are very disappointing. A simple hand stripper can be purchased, and in almost any community blue grass pastures can be found which will yield a far better product than that purchased on the market. I know of no other practical method of securing seed of known vitality. Another source of danger in buying blue grass seed is found in the adulterations which are now added to the pure seed. The most common adulterant is the seed of the small Canadian blue grass (*Poa Compressa*), which has much less value as a pasture.

MAINTAINING A BLUE GRASS PASTURE.

The productiveness of a pasture is in many cases greatly diminished by the presence of brush and weeds. It is hardly necessary for me to call your attention to the fact that a pasture cannot reach its maximum production if ragweeds, ironweeds, thistles and other rank growing weeds are allowed to grow. All of these can be cheaply destroyed by mowing.

It has been my experience that pastures which are allowed to make a vigorous growth during the first part of the season are generally the most productive.

The leaves are the laboratories in which the plant food is elaborated and from which the plant substance is sent to all parts of the plant; the roots of grass store substances, which prepare the plant for a vigorous growth the following year. If the leaves are destroyed by pasturing too closely during the early growing season, when this transfer of substance from leaves to roots takes places, then the plant is temporarily weakened. The most productive pastures I have ever seen have invariably been those that have not been too closely pastured. Many of the best pastures are not used at all until September, but this method is not practicable in all cases.

FEEDING CATTLE ON PASTURE.

One of the most successful methods that has so far been suggested and tried for increasing the productiveness of all kinds of pastures is feeding grain to animals while on pasture. I am aware that most of the books tell us that it is not profitable to feed grain to cattle while on pasture. Notwithstanding this fact, by reference to the chart before you, you will observe that a very large per cent of the most successful cattle feeders in the central west practice this method of finishing cattle. Not only is this true, but it is my opinion that there is no more profitable method of finishing cattle.

PRACTICAL EXPERIENCE IN WINTER AND SUMMER FEEDING.

What season of the year has proven most profitable for full feeding?

	Missouri.	Iowa.	Illinois.	Average.
Number of reports	697	86	35	818
Winter—per cent	8.18	10.46	14.29	8.68
Summer—per cent	50.64	52.33	45.71	50.61
Spring-summer—per cent	14.20	4.65	5.71	12.83
Summer-fall—per cent	8.18	7.00	5.71	7.95
Spring—per cent	6.45	5.81	11.43	6.60
Fall—per cent	9.90	18.60	14.29	11.01
All seasons—per cent	2.44	1.16	2.86	2.32

This chart is compiled from reports received from a very large number of cattle feeders in the middle west.

The main purpose of all cattle feeding is to secure a certain degree of fatness or finish which will satisfy the demands of the market. It will be admitted without argument that this degree of fatness or finish cannot be secured by feeding cattle on grass alone. The usual method is to feed cattle heavily on grain, generally during the winter, but many of our most successful feeders believe it is more profitable to carry on the finishing process by feeding a full feed of grain to animals on pasture.

We have but one experiment at the Missouri station on summer feeding, to be compared with five years' work in winter feeding, but the results are certainly favorable to grain feeding animals on pasture.

WINTER AND SUMMER FEEDING COMPARED.

Winter Experiments Extending over Five Years.	
Total grain fed—pounds	238,872.00
Total roughness fed—pounds	91,450.00
Total gain in weight—pounds	23,910.00
Average amount grain per pound gain—pounds	10.00
Average amount roughness per pound gain—pounds	3.82
Average grain daily per steer—pounds	21.29
Average roughness daily per steer—pounds	8.15
Average daily gain per steer—pounds	2.13

Summer Experiments Extending over One Year.	
Total grain fed—pounds	120,279.00
Total gain in weight—pounds	16,709.60
Average amount grain per pound gain—pounds	7.19
Average amount grain per steer daily—pounds	13.42
Average daily gain per steer—pounds	1.86

Eight and fifteen tenths pounds hay eaten daily in winter at $6 per ton is 72.3 cents per month per steer. Thus roughness about offsets pasture, giving more rapid and cheaper gain, besides requiring less labor and steers make better gains.

The table shows clearly that larger gains may be secured and that these gains are in many cases cheaper and the feeding period materially shortened by grain feeding on pasture. It will be observed that the amount of grain required to produce a pound of gain during the winter is 10 pounds, while on summer feeding it requires only 7.2 pounds of grain in connection with pasture to produce one pound of gain.

The benefits to the pasture cannot be overestimated. In the first place, animals fed heavily on grain will not require so large an area of pasture and in the second place the droppings of the animals will materially enrich the soil and increase the productiveness of every acre of grass land. The accompanying photographs show very clearly the results of different methods of feeding cattle on pasture. In this case as in all other similar cases, the kind of food fed will determine the benefit to the pasture. Whenever foods rich in nitrogen constitute a portion of the ration, like cotton seed meal, linseed meal or gluten meal, the value of the droppings is much greater than when pure corn is the ration fed.

SOME VALUABLE FORAGE PLANTS.

In speaking of forage plants, I desire to call your attention only to three or four which have been so successful as to commend themselves to every progressive stock man. In general, in the production of forage plants for hay we should in every way possible plan our affairs to produce leguminous plants, alfalfa, clovers, cow peas, etc., for two reasons: First, because of their immediate value as soil improvers and second because of their especial value in increasing the effectiveness of feeding rations. On the first subject, I shall not at this time speak, but in connection with the feeding value of nitrogenous plants I wish to call to your attention some experiments which the Missouri station has recently completed which seem to me to be very significant. It has been generally supposed that the roughage in the feeding ration was not particularly important. This belief, however, while quite commonly held among some very large cattle feeders, has never been based upon accurate experiments. The Missouri Experiment Station has, I believe, demonstrated that the roughage in a ration may add very materially, sometimes as much as one-third, to the efficiency of the ration. This has also been brought out clearly by the Illinois Experiment Station.

DIFFERENT ROUGHNESS FOR FATTENING STEERS.

First trial: Jan. 6, 1901, to April 16, 1901—100 days. Four 2-year-old steers per lot. Full fed on shelled corn:

Kind of feed.	Corn eaten—bushels.	Hay eaten—lbs.	Total gain—lbs.	Average daily gain—lbs.	Gain per bushel, corn—lbs.
Corn—timothy....	166.5	2,813	802	1.69	4.80
Corn—cow peas...	188.0	2,662	1,257	2.64	6.68

Second trial: Four 2-year-old steers per lot. Full fed on shelled corn

Kind of feed.	Corn eaten—bushels.	Hay eaten—lbs.	Total gain—lbs.	Average daily gain—lbs.	Gain per bushel, corn—lbs.
Corn—timothy....	157.5	2,540	796	1.97	5.00
Corn—clover......	176.0	4,768	1,135	2.84	6.45
Corn—cow peas...	175.0	4,783	1,134	2.84	6.45

By using good roughness the beef produced by each bushel of corn was increased 1.69 pounds which, at 5 cents per pound, amounts to 8 cents per bushel extra for the corn.

In a feeding experiment lasting 199 days, two lots of yearling steers fed on corn and timothy hay required 1,151 pounds of corn to produce 100 pounds of gain. In another experiment lasting the same length of time, with the same class of cattle, corn and cow pea hay required only 831 pounds of corn to produce 100 pounds of gain. Other experiments at the same station have shown clearly that nitrogeneous fodder rations like clover hay, cow pea and alfalfa hay have invariably given markedly better results than has timothy hay and corn fodder or sorghum hay. This is clearly brought out in the tables. Not only has clover, cow pea and alfalfa proven to be of very great efficiency in connection with corn for fattening cattle, but it has also been shown by experiment, also by the Missouri station, that when yearling cattle are wintered on a light grain ration, these nitrogeneous roughnesses invariably produce greater gain on a given amount of corn than do timothy, corn fodder or sorghum hay.

It has, of course, been repeatedly shown that corn can be made more efficient by balancing the ration with some material like cotton seed or linseed meal which is made up largely of nitrogenous or protein substances. It ought to be no surprise, therefore, that these nitrogenous fodders will produce so much better results than timothy or corn fodder. Another thing about these experiments is that the value of corn fodder can be greatly increased by using it in connection with clover, alfalfa or cow pea hay. In all of our experiments, as shown by the tables, the corn fodder and clover hay mixed half and half prove a better fattening ration than timothy hay. Where clover and alfalfa cannot be grown successfully, cow peas have proven of the very best value in connection with soil improvement and cattle feeding. The value of cow peas for improving soils has been repeatedly demonstrated. The value of cow peas in a feeding ration has not been so generally accepted, but our experiments show conclusively that cow pea hay is an exceedingly valuable adjunct to the feeding ration when animals are being fattened, or only wintered.

I have tried to call your attention in this discussion on grasses and forage plants, first, the importance of more attention to the maintenance of pastures and to the production of the right kind of forage plants. I have also attempted to show that the American people cannot hope to maintain their present high place among the stock growing countries of the world without paying special attention to its pastures. It has also been demonstrated that the character of roughnesses fed in connection with the grain ration is worthy of our most careful consideration and in general, balancing the ration by using nigtrogenous roughnesses is a cheaper and more effective system than buying expensive protein feeds.

DISCUSSION OF PROF. MUMFORD'S PAPER.

Q. Please explain the stripper.

A. We purchased the stripper. I can't tell you who makes it. It was $1.50 or $2.00, and is a hand stripper, and a man can strip a large quantity, and the yield of seed is considerable in an acre.

Q. Do you not use the seed a short time after it is gathered to prevent heating?

A. Yes, sir; it is used immediately to prevent heating.

Q. Does your stripper prepare it?

A. No, sir.

Q. How do you sow it?

A. By hand.

Q. The ground?

A. The ground should be thoroughly prepared. The best way is to plow the land thoroughly, prepare and sow it alone, but it can be sown with some grain crop, with wheat or with any fall grain, rye; but if you sow soon after it is harvested, about the only way you can do is to prepare the ground and harrow it in.

Q. Do you get blue grass the next year to amount to anything?

A. No, sir. You get a start, but the blue grass pasture does not come quickly into profitable use. You can sow clover with the blue grass, and where the conditions are favorable we get a crop of clover, and that works very well.

Q. Don't you find it an advantage to sow another grass with it?

A. We find the pasture will carry more cattle when we sow the orchard grass with it.

Q. Doesn't it kill out readily—the orchard grass?

A. No, sir; it lives perennially and is very tenacious with us.

Q. How much per acre?

A. About 14 pounds of the unhulled to the acre, eight or ten pounds of the hulled seed; perhaps ten would be nearer.

Q. What is blue grass?

Q. What do you say about six pounds of that and put in timothy?

Q. I have been 66 years on one farm, and I would like to know the difference between native blue grass and the Kentucky blue grass.

A. Botanically exactly the same.

A. How can you tell the seed?

A. You can't; only an expert, a botanist, who has the use of a microscope of some magnifying power.

Mr. Thurston—You have Canada blue grass with your Kentucky blue grass in your pastures? Don't you find a certain amount advisable?

A. No, sir; we think not. It is pretty hard to test it, but we believe the room of the Canada blue grass is better occupied by orchard grass.

Q. What possibility of getting a blue grass and clover pasture by sowing now?

A. That might work well, but still you would have to sow a large amount of blue grass. It would take a longer time for the blue grass to come into profitable bearing. Where your pasture is poorly set, as it is sometimes, take the disc harrow and harrow up the bare spots and sow the blue grass on the spots. The seed is very vital, and you must have your ground in a fertile condition; but the preparation of this seed to a large extent destroys its vitality, and I cannot understand it.

Mr. Wallace—The Kentucky blue grass is taken from the different plants and put in a pile, and in a very short time it gets so hot you can't put your hand into it, and that is what is the matter with it; and they run it through a cleaner, and they sell the clean seed for fancy cleaned and the chaff for extra clean, and you only get a stand of about 5 or 6 per cent, and the country merchant sells it to the man who wants to buy things cheap, and the trouble is it goes through this heating process.

Mr. Mumford—I don't understand why it heats so quickly in half a day and if you put it right on it is all right.

Q. What is the nature of the ground?

A. The kind of soil, the particular soil which I am talking about now and which the photographs show, is hill land about eight or ten miles from the Missouri river. It is not Missouri hill land exactly. It is just on the edge of it.

Q. Does the blue grass spread from underground roots?

A. Yes, and we have found we can strip the seed from a pasture and I secured $20 worth of seed and the pasture was in no way injured to all appearances, but we could not pasture it until the seed was taken off.

Q. Does it not pay to let the first crop go to seed?

A. And sell the seed.

Q. Let it seed down?

Mr. Mumford—It is not necessary, sir.

Mr. ————One idea you failed to bring out. In southern Illinois we have a great deal of trouble getting a stand. Can you get your ground seeded early?

A. You can if you can get vital seed.

Q. How about letting it fall on the ground?

A. That is not the quickest method.

Q. How many years in Missouri to get a fresh stand as good as that that comes in naturally?

A. You mean a good stand.

Q. When will it reach its highest point?

A. Four or five years.

Q. It will take 20.

A. Well, sir, I don't know.

Q. Is there any difference between the blue grass of Kentucky and the grass that comes in here?

A. I don't know; I presume it is exactly the same. The blue grass in Illinois, and in Minnesota, Iowa, Missouri and Kentucky is the same botanically as the blue grass of Kentucky.

Q. How is the best way to get a corn field into grass this spring?

A. I think it ought to be plowed and thoroughly prepared and get vital seed in your community if you can. Do not sow it until you are sure it is vital. If you must get the seed in your locality by stripping wait until you can sow it and harrow it in lightly.

Mr. Wallace—I was in Madison county in 1877 and from town I noticed the further you went north, south, east and west the less blue grass you got. I watched it for 15 years and I know it is a fact that the blue grass in this country started from the towns. It was carried in the saddle bags instead of money to pay the bills at night. You will find the blue grass growing all over the prairie; it came from the streets in town and gradually spread out all over the country. The best blue grass pastures are fields never touched with the plow. You know the blue grass came into this part of the country with the Presbyterians and dog fennel with the Methodists.

Q. Will you get clover in a blue grass pasture?

A. No, sir.

Q. Is it difficult to test the seed?

A. No, sir. I would use the same test shown here for the corn, except I would use paper without printing as the seeds are so tiny.

Q. When would you strip for the seed?

A. Just before it falls, the riper the better.

Q. How many peas do you plant to the acre?

A. We plant a bushel and a half to the acre because we want fine stalks.

Q. Do you get them?

A. Yes, sir.

Q. How do you harvest them?

A. Cut and dry them. Don't let them get rained on. We have some trouble in curing the cowpeas. The Whitmore, Clay or New Era are the best varieties of the cowpeas, the New Era is very early.

Q. What does it cost?

A. From $1 to $2 a bushel.

Chairman—The Resolution Committee are ready to report and we will listen to the resolutions.

The Committee on Resolutions reported as follows, and on motion the resolutions were adopted without discussion or any opposing votes:

FOR AGRICULTURAL COLLEGE AND EXPERIMENT STATION.

WHEREAS, The various agricultural organizations of the State have united in asking for certain appropriations for the benefit of agriculture, embodied in a bill entitled "An act to extend the equipment and increase the instruction in the college of agriculture, and to provide for the extension of the agricultural experiment station and to make appropriation therefor;" and,

WHEREAS, The investigations of the experiment station in coöperation with the various agricultural associations during the last two years will many times repay the outlay by leading to improved practices and preservation of the fertility of our lands; and,

WHEREAS, It appears that the growing need for buildings, for college and station purposes, and additional equipment and instruction to meet the demands of the rapidly increasing body of students can no longer be met by United States funds alone, and because the college should not stand still nor go backwards, but should, like the station, be put upon a permanent financial basis with State funds; and,

WHEREAS, The amounts asked, both for investigation and instruction, are such as have been reviewed and approved by the advisory committees of the respective agricultural associations; and,

WHEREAS, The farms of the State bear even more than their just share of the burden of taxation, therefore be it

Resolved, By the Illinois Farmers' Institute, in annual session assembled, That we make no unreasonable demands upon the public funds when we respectfully urge upon the General Assembly the passage of this bill in full and without reduction of the amounts requested by the agricultural organizations interested.

FOR PERMISSIVE CENTRALIZED SCHOOLS.

Believing the solution to many of the existing school problems lies in the centralization of our rural schools, therefore be it

Resolved, That the farmers of the State of Illinois, in institute assembled, hereby respectfully petition our State Legislature to enact such changes in the school law of the State as will admit of free transportation of pupils to and from school where the same shall have been ordered by a majority vote of the legal voters of the territory sought to be consolidated into a centralized district.

PUBLISH DAVENPORT'S ADDRESS.

Resolved, That Professor Davenport be requested to prepare for publication the address delivered by him before the institute at this meeting, in order that the information it contains may be generally available throughout the State.

TO TEACH AGRICULTURAL SCIENCE.

Resolved, That we urge upon the members of our General Assembly the importance of such legislation as shall make it obligatory on the part of teachers in our public schools to prepare themselves to teach the elements of agricultural sciences.

PRINT SCHOOL INFORMATION.

WHEREAS, The Illinois Farmers' Institute realizes that there is very great need for further improvement in country schools; and,

WHEREAS, The consolidation or centralization of country schools has been adopted to some extent in several other states; therefore be it

Resolved, That the Agricultural College of the State of Illinois be requested to collect and publish in this State exact information relating to the methods, the difficulties and the advantage of the consolidation of country schools, especially with reference to the progress and present status of such consolidation where it has been adopted.

MODIFY FERTILIZER LAW.

WHEREAS, The method of stating the analysis or composition of commercial fertilizers commonly practiced is unnecessarily complicated;

Resolved, That a committee be appointed to draft an amendment to the State fertilizer law to the effect that statement of analysis shall include the percentage of the elements phosphorus and potassium; and,

Resolved, That the present General Assembly be urged to enact such an amendment into law.

TO PROTECT QUAIL.

WHEREAS, We, the farmers of Illinois, in institute assembled recognizing the inestimable value to the farmers of the quail in the destruction of injurious insects; therefore be it

Resolved, That the Illinois Farmers' Institute do request the present State Legislature to enact legislation placing the quail in the same class as song birds, making it a penalty to shoot quail at any season of the year.

BLOOMINGTON CITIZENS THANKED.

Resolved, That we hereby extend to the citizens of Bloomington, to the Business Men's Association of Bloomington, to the McLean County Farmers' Institute, and to those who so kindly assisted with music and otherwise, our appreciation and thanks for the many courtesies extended and for their liberal aid which made it possible to hold the institute in Bloomington.

B. F. WYMAN,
GEORGE W. GALE,
EDWARD GRIMES,
W. W. COLE,
A. N. ABBOTT.

THURSDAY AFTERNOON 1:30 O'CLOCK.

Mrs. Joseph Carter presiding.

Chairman—The hour has come for the program and the first thing is the music by the High school orchestra.

Music—High school orchestra.

The next thing on the program is the report of our secretary. Mrs. S. Noble King.

REPORT OF THE SECRETARY OF THE ILLINOIS ASSOCIATION OF DOMESTIC SCIENCE.

' Mrs. S. Noble King, Bloomington, Ill.

"What is the Illinois Association of Domestic Science, and what is it trying to do?"

This question, often asked, is a practical one and deserves a reply.

First—It is an organization of women composed of delegates from each county association affiliated with the county farmers' institute and from clubs auxiliary to these associations; also delegates from other domestic science organizations.

Second—"The object is to awaken in women a greater interest in their work and a desire to better inform themselves regarding it; and to bring to them a knowledge of the current literature on domestic science topics, especially the bulletins sent out by the government experiment stations, and the farmers' bulletins which give information on these matters; also to work for better methods and more conveniences in performing house work, a better knowledge of foods, their nutritive and their economic value, and a knowledge of sanitary science and hygiene.

"The work of the house-wife is both an art and a science and to be most skillful in the art one should know the science. The laboratories of the chemist and biologist are constantly bringing to our knowledge facts that all house-wives should know; facts so simple that it is possible for all to know them if they will give a little time and thought to the study of their work."

The practical object of each county association is to bring together women, otherwise widely separated, for the purpose of discussing matters of vital interest to the home, and incidentally to the nation, since no nation rises higher than its homes.

The clubs auxiliary to these are composed of women who, by reason of distance from the place of meeting of the county association, or because of other conditions, find it more convenient and agreeable to form separate clubs.

This feature cannot be too strongly recommended. By this means many who would otherwise be cut off from participation in the work can take active part and render valuable aid.

In the beginning these associations were designed especially for the farmers' wives and daughters and it was intended that they should be to them what the institute was to the farmers, a short school, a club that would meet once a year for instruction and entertainment. They were given at least one half day on the program, and from the first the men have been as much interested in this feature of the work as the women themselves.

We are pleased to say that the line of demarcation, as to membership, has been entirely obliterated. It is doubtful if a county association can now be found composed wholly of women from country homes, though some of the auxiliary clubs undoubtedly are. On the other hand, one auxiliary club, at least, of which I shall tell you later, is composed entirely of women living within the city limits. This is as it should be. No barriers ought to exist between women interested in the same objects, working for the same purpose—the character building of children and the idealization of the American home.

It was soon found that a meeting held but once a year could have little practical value. hence the workers in many counties decided to hold regular meetings, usually once a month, for the purpose of study, discussion and recreation. In some counties one feature has predominated while in others more time has been given to a different one.

Carefully arranged programs for the next year's work attest the interest felt, and the attendance, sometimes under very unfavorable conditions of weather, proves the enthusiasm of members. Like the proverbial twentieth century woman, a step in advance has been taken each of the last three years, and this association hopes to make an advance until the women in every county are associated together in an effort to make homes in each community centers of harmony, beauty, sweetness, and light.

By organized, systematic, earnest effort directed towards a definite purpose the women of Illinois can raise the standard of homes and improve the opportunities for children. They can coöperate intelligently with educators in their work, for coöperation of home and school is of three-fold value. It benefits the parents, teacher, and pupil.

The three steps marking the advance work of this organization were: First, the securing of a household science department in our State University. Second, the securing of a free scholarship in that department for one young lady from each county (providing that county has an Association of Domestic Science in connection with the Farmers' Institute). Third, it has organized a new society or school for housekeeping, which is held annually at the State University during the last two weeks of January, at the time of the convention of the Stockmen and Corn Breeders. This is the "Housekeepers' Conference." Instruction is given by the teachers in the household science department and by professors in other departments whose work correlates with theirs.

It is a matter of regret that so few counties have organized during the past year. The institute officers in these unrepresented counties report that it is very difficult to induce women to venture into work that seems so new to them.

There is need of a competent, well-prepared woman who could present the subject of domestic science, in its broadest sense, at county institutes and also to local clubs. Inquiries are frequently received for help in this line from clubs already formed, but uncertain of what would prove most valuable.

Another need expressed by societies that have done considerable work is for something more definite—a course of study that shall have permanent and practical value, and that shall make our work more uniform. Still another request comes from a county superintendent of schools for "specific directions for a line of work and study for the girls of a 'Young People's Farmers' Club.'" A president of a county association asks for "something to stimulate young girls in better preparation for homes." It is encouraging to note that the extension of work in counties previously organized has been rapid in the matter of auxiliary clubs. McHenry has six, Champaign five, Christian five, while a number of others have three or four.

A short report from a number of counties will be printed in the year book for 1903.

From the first it has seemed wise to allow each county to work along individual lines according to local needs and conditions. However, the association does earnestly urge the use of books in the domestic science library, which may be had for the use of a club three months and by individual members for two weeks simply by the payment of postage or expressage both ways. The number of books used has been found to be a good indicator of the spirit which animates the members. It further urges that these organizations shall have frequent meetings for the purpose of study and discussion, believing that much will be gained socially as well as intellectually by this method. It is deemed wise to advertise every meeting, with the time, place, speaker and subject, in the local paper, without limiting the attendance to members, and invitations should be extended to all who are interested.

It is recommended to the officers of county farmers' institutes that the names of the officers of the Domestic Science Association appear on the program; also that they be supplied with necessary stationery unless they have a fund of their own.

The McLean county method of securing a fund, has been found satisfactory.

The premium list for the institute plainly states that "When an article is offered for a premium said article becomes the property of the institute." These exhibits are sold at auction the last afternoon.

By an arrangement between the executive committee of the institute and the association, the proceeds from the sale of the pantry stores is given to the association. Out of this, premiums are paid, expenses of speakers for their session, an expert judge on pantry stores, an expert to score and judge butter, and any other expense incurred in that department during the exhibit. It is expected that enough will remain for incidental expenses during the year and also to send a delegate to the annual meeting.

This year after all expenses were paid there remained in the treasury about $40. This may be suggestive to other societies who are worried over ways and means. At first it was thought best to invest what surplus money there might be in the treasury in domestic science literature, but the generosity of the State institute in providing us a library of 120 volumes made that unnecessary.

Not for the purpose of exploiting the work of the State association, but as an inspiration to the thousands of women who have had a share in it, I take this opportunity to mention a few of the instances in which encouragement has been received from beyond our State lines.

A Chicago paper reporting the National Associatian of Household Science, held in Milwaukee last October, said: "Reports of the work in the various states were given and it was said that Illinois' advancement in this line had been more rapid than that of any other state in proportion to the length of time that has elapsed since the foundation of the Illinois society."

Within a few weeks letters have been received from Iowa, Rhode Island, Washington, Arizona, and Minnesota, (the writers being entire strangers), asking for a report of our work. The last was from an institute worker in Minnesota who wishes to introduce domestic science into the rural schools in the sparsely settled districts of Northern Minnesota. What is the significance of these messages coming from such varied sources and such widely separated localities? It simply means that women, and men too, are awakening to the fact that domestic science is worthy to be placed beside other sciences, and that together with household art, it should become the symbol of what we hold most dear. The philosophy of Aristotle is the philosophy of the home. "Every manner of living, each of our actions, has a particular end in view and all these ends have a general aim, happiness."

Realizing as we do, the difficulties besetting the present day housekeeper who tries to adjust her former practices to the more sensible, sanitary and hygienic methods of to-day, we feel a great desire to provide the girls of the present with the education and training that will made them useful and efficient home-makers. Let them have the broadest general culture possible, but along with it they should have special training for probable duties.

At the farmers' institute in Sangamon county, a resolution was passed recommending the introduction of household science into our normal and public schools. In a rural school in Tazewell county last summer, Miss Edna Heaton, with only a chafing dish as an equipment, taught the children some valuable lessons in food principles, nutritive values, and ways of cooking.

This is a day of small beginnings in the teaching of domestic science in the rural schools, and when we reflect that there are 10,723 rural school districts in Illinois, the girls of which are to be the home-makers of the near future, we are justified in urging a course of study that shall prepare them for the work. In England this has been in operation 25 years. It is, however, a matter for pride and congratulation that even a few teachers have done pioneer work in domestic science, and it is eminently proper that their names should go on record as such. Miss Alice Stout, of McLean county, and Miss Edna Heaton, of Tazewell county, are deserving of praise for their work along this line. If there are others their names have not reached the secretary who will be very glad to add them to the above list.

The building of a system of ideal homes in any community must be accomplished by an evolution and not a revolution, hence the preparation of girls for the work is an urgent need.

An auxiliary club, previously mentioned, in this city has solved the problem of "How to put cooking into the public school," by putting it in. At a meeting of the mothers and teachers someone said, "We've been talking about this for a year. Now I think it time that we do something."

The idea was well received, a conference was held and a committee appointed to arrange an outline of work. An unused room in the basement was papered and painted, a new range was purchased, an equipment of utensils was provided for the girls, and on one day of each week they are taught something of food principles, nutrition, hygenic cooking and economy in the use of food and fuel.

Several of the mothers served in turn as teachers, having previously made a study of foods in their relation to health. Other features of the work are of interest but time forbids mention of them.

These facts are of special interest because they fall in line with article II of our constitution, which provide that "We shall labor for the introduction of domestic science into our educational system."

Chairman—I have been asked to present this resolution by Mrs. Dunlap:

WHEREAS, The woman's building at the State Fair grounds was destroyed by fire, therefore be it

Resolved, That the Illinois Farmers' Institute request of the General Assembly an appropriation of sufficient amount to rebuild and equip said building, realizing that the home interests of the State require fostering and advancing if all within its borders expect to reach a high state of development.

Mrs. President--I move the adoption of this resolution.

I second it.

Chairman—It is moved and second that the resolution as read be adopted. Are there any remarks? If not I will put it immediately.

As many as in favor of this signify by the usual sign. That is not hearty enough. I want a better vote. Contrary, no.

It is carried.

Chairmain—We have a lady with us that we used to call Miss Nellie Kedzie, but she went away to Kentucky and changed her name to Nellie Kedzie Jones and we are happy to have her with us.

NOTE—For constitution and by-laws of the Illinois Association of Domestis Science, minutes of the business meeting at Bloomington and other items of interest to local clubs, see appendix to this report.—SECRETARY.

WHAT SHOULD MOTHERS ASK FOR IN THE TRAINING OF CHILDREN.

Mrs. Nellie Kedzie Jones of Berea, Ky.

Mrs. Jones—A man dreamed he died and of course he went to heaven and he looked about and saw a number of men with balls and chains, and he didn't understand it at all, and as he went about again and again he would see men chained, so he went to St. Peter and said, "I don't understand this. I thought this was heaven, why are those men punished." St. Peter said, "Those men are not bad, they came from Illinois and had to be chained to keep them from going back." They didn't put chains on me in Kentucky and so I am back to see you.

The school is the provision made by the State or community for helping mothers and fathers to educate their children. No one in all the world can have so much of interest in the growing child as do the parents, to whose care God has entrusted the guiding of the growth Nature gives. No one can take so much interest in the training of the child as the parent. Educating children means training them to become the best citizens possible.

It is right and just that the parents have the guiding power over the schools planned and paid for by the community. Hence we elect the most representative people possible on the school boards.

The duty of the parents is by no means fulfilled when the school board is elected, but every father and mother in the district is in duty bound to do and to give the very best thought possible to make the school training better every day.

While neither parent has any more real responsibility than the other, we have come to look to the mother for more of the actual work of caring for and training of children; and so to-day, for a short time, it is worth our while to look over the work of the schools and see what the mother should ask for that her children may have the best preparation possible for good citizenship.

The change in education from the three "r's" to the three "h's," from "readin'," "ritin'," and "rithmetic," to training of head, hand and heart, has been one great stride of progress the century past has just made. We are realizing in a full sense that a heart to purpose, a brain to plan and a hand to practice are the essentials for full living to either man or woman.

The mother then should ask that such an education as will fit her child to live a full rich life be the training the schools help her to give.

Not long ago the dividing line between different types of education was as pronounced as was the line in politics. In war times a man must be either a federal or a confederate—there could be no middle ground—and the struggle for supremacy was long and bitter. Many of you remember the heart aches, and the sorrow, because each side believed its own cause was right. Today, when the two sides are blended into one nation, harmony and happiness are our heritage, and both north and south grow stronger every day for the help given each through the differences found in the other.

The war in educational matters was not a war of gun and sword, yet, the heart ache in some cases was not easy to bear. When the world conceded education to mean only the reading of Greek and Latin and the study of mathematics, the man who dared to say there was true training for the mind in studying the trees or the rocks, the insects or the birds, was derided and scorned; and as the people, that greatest of all powers in our land, slowly came to the point where the practical side was demanded, there was a bitter struggle to hold the schools to the old lines. If the inside history of many a college in this land could be known, there might be a long story of actual warfare over the two types of education. But a better day is with us, and now the world is trying to balance up the work of all schools by taking the best of both types and putting it before the pupils as a whole until they are men and women, then planning for each student according to the talents given him, seeking carefully that none dig in the ground and hide his Lord's gift.

Because one boy or girl is a genius in acquiring languages, that is no reason why every child must be dragged through years of language study beyond that necessary to know his own mother tongue and use it with power and effect. Because one man is interested in plant life to the extent that he can give to us all new facts about plants every year is no reason why every child should have to study botany beyond the point where he can recognize his friends and foes in the plant world and be ready to find the facts he wants as occasion requires.

When the time comes that all schools shall follow the example set by those of the most liberal cast, and every institution of learning will carefully select out of the two types of study—classic and scientific—that which will do most toward rounding out the growth of the mind and making the child the most level-headed, broad-minded man possible, we shall hear fewer sneers about dead languages and wasted years. There is no doubt but that the culture and grace possessed by many of our public speakers—and say what you will, they have much to do with the moulding of public sentiment and the consequent swaying of the people—the culture and grace that makes them attractive speakers, the power to put ideas strongly before other people, is largely due to the training given them in the languages from which our own English words are derived. It means much to be able to discriminate between shades of meaning, and as a people we are sensitive to these touches and respond very readily to the sentiment aroused. Occasionally we find an American who possesses in a rare degree that power with words without that early training. Lincoln was a genius in that direction, as well as in many another.

But we are not all Lincolns, and the marvelous power over words shown in his Gettysburg address, in the various messages that came from his pen, can be attained by the rank and file of American citizens only by long and patient study. It is a curious fact that the people who have had least opportunity to know the origin and the meaning of words are most fond of huge mouthfuls of syllables, like the negro preacher or the beginner in Fourth of July oratory. Those who have most loved and studied words make most out of those of simple form. We never expect our young people to become athletes without training. Can we expect them to be able to impart their ideas without good training in the use and meaning of language?

The great mass of our people today recognize in the scientific side of school training development of soul along with the growth of mind needed. The sermons in stones, the books in running brooks, must appeal to the better part of humanity, and the true scientist must, because of his life with nature, live more closely to nature's God.

We often hear of specialization, and there is an argument in favor of early specialization, providing one is really working to make specialists instead of men; but the ablest specialists have been and are those who were first well-rounded out people, with heart and head and hand so balanced that their special work had always the touch of human love for humanity, and thus the glory of soul work was added to knowledge of the secrets of nature.

The best doctor is the man who is educated in many lines, who has had a thorough training under earnest Christian men and women, until he is a rounded-out man, who has thinking power before he touches the special study of medicine. The minister who wields most influence for good is the man first, and the better his general knowledge the more effective will be his special work. One of the strong teachers in scientific lines, whose works belong to the generation just past, began his work in agricultural chemistry when he was 40 years old. The work of forty years has turned largely to definite results for the good of humanity. A state senator said of him: "His chemistry has put millions of dollars in the pockets of the farmers of our state. And that is only one line in which he has turned his work. Everything he touched was questioned as to how it would be better for the human race; every problem was solved with an idea of making life easier or happier for some one. One reason why he has worked so generously for the definite good of mankind is because he had a man's view of the great world before him before he became absorbed in his special line of work. The pursuit of science for science's sake only is akin to the feeling of a great mathematician that prompted him to say, on the discovery of a new solution to a problem: 'Thank God, nobody can ever use that!' Today we know that only as knowledge is used can it become a power for good."

Teaching the young people a judicious amount of the classics to develop the power of imparting ideas, teaching such an amount of science that they may have ideas to impart, will give the kind of brain training we desire in the schools. Brain training is well, but that is only one-third of this balanced education we hope to see in every school. When we consider that we have two channels of expression—one being the tongue, the other the hand—we at once believe the statement that for generations we have undertrained the hand and overtrained the tongue.

While language and singing seem to be the only avenues of expression by the tongue, the hand has a number of ways by which it gives ideas to the people—through painting and sculpture and instrumental music, through landscape gardening and architecture, to say nothing of the mechanic arts. We say educate the child that the man may have ideas, but those ideas are but a selfish possession unless worked out for the benefit of the world. Ability to work out the ideas that can be expressed only by objects made by the hand gives the world the men and women who have done most to beautify our lives. They have helped us into higher, happier thought because we saw evidences of the power of well guided humanity. The wonderful White City of a decade ago means little today to those who only heard it described. The greatest meaning comes to those who wandered through the streets, over the bridge, gazed upon the fountains and the well-arranged grounds, looked upon the buildings or sat in the court of honor. A new meaning comes when one mentions the moon light on the lagoons, with the song of the gondolier or the chime of the bells ringing out in the twilight hour. All this was possible only because trained hands had been able to work out the ideas evolved by trained brains in such shape as to reveal those ideas to every beholder.

Buildings are not the only means of communicating ideas by handicraft. The piano sends out wondrous music only as the trained hand touches the keys. The canvas delights the eye and cultivates the artistic sense only after it has been touched by skilled fingers. The block of marble yields its imprisoned Venus only as the chisel is guided by a quickened brain working through hands that are so deft and so ready they can almost create a soul in the beautiful figure of stone. Do you say I am speaking of genius, not of training? Then I say to you the genius of an artist burns in the soul of many a man who has never had the opportunity to train the hand, and who thus lacks the power to show the world the ideas that flame within him. The genius of a Blind Tom is perhaps more than the genius of a Paderewski. The one was untutored and untrained; the other had the best training the world could give his fingers. I leave you to judge of the power the two men have exerted on the musical world.

All manual training, properly speaking, is training the hand to work out the ideas of the brain. A man may be a good workman in one direction and still lack real correlation of brain power and hand skill. It is only when the two work together that a man is well educated. I believe the day will come when one who can use only his brain will be considered but half educated, just as much as we today consider the man who can use only his hands as only half trained. It is as poor economy to use only half one's powers as to expend power where it accomplishes no end.

The movement of industrial education is only a new inspiration of the best head and heart wisdom of the whole world for the emancipation of workmen from the old-time ignorance and inefficient toil that marked the difference between drudgery and happiness. It is well for us to remember that the term industrial education should have the accent on the last word. It is industrial education, and education means to lead out and use all we have. Industrial may mean any kind of drudgery, but to have an industrial education means that the hand mst be guided by a trained brain, and that must have behind it the quickened and understanding heart. Ruskin says: "There is no healthy thought without labor, there can be no happy labor without thought—the two must go together." The grand old man of England recognized this, for when he wished to think his strongest he went out and chopped trees.

The men and women who have given something the world wanted to remember have been men and women who were no halt-way people; they were whole workers—workers with head and heart and hands. When a woman who has perhaps given this country the strongest novel of the past century, washed her dishes and moulded her bread between pages, she brought a practical realization of the science of living, which meant more than brain work, more than hand work. It meant both together, and therefore gave a strong personality that showed to the reader of "Uncle Tom's Cabin," how a womanly heart could stimulate a strong brain and conceive the great things of life.

We say, in order to understand the thoughts of others we must learn to think. I say, in order to understand the work of others we must learn to work. Doubtless few of us will think really great thoughts, but we all hope to appreciate them; so we can expect to understand great work better if our own hands are deft and ready to do some of the many kinds of work the world demands. There is little danger but that the American boy, unless an idiot or a criminal, will some time in his life find hard work for either body or mind. It seems a part of the birthright given in this land of labor and plenty. Well for him if his work is well balanced, and have that of both brain and hand. The girl, too, born to American ideas, will work, if she have the average amount of brains. The pertinent question is, how to train these young people that work may mean more result and less wear and tear.

Domestic economy, giving as it does, power to judge and buy, to construct and wear clothing, helps a woman to dress herself and her family with the least expenditure of time, money and labor; giving, as it does, knowledge of household fabrics and furnishings, gives ability to make the house attractive, and to so care for it that the greatest amount of happiness to the square inch is yielded every day. Domestic economy gives knowledge of the production, the preparation, the serving, and the value to the body of foods, enabling her to give her family good physical and mental power, while it also gives her training in the care of herself in health and of her loved ones in time of illness. She is enabled to easily manage all the various lines of her business; and who of the whole world carries so many lines as the housewife? This ability to manage all the departments of her home comes to her not alone through her knowledge of theories, but through application of known principles by her own hands that have been trained in all the lines of domestic demands. While she knows botany for her fabrics and foods; entomology for her insect friends and foes—foes usually predominating in the home; physics, which is only scientific common sense about the common things of life; chemistry for the combination of the elements; bacteriology for knowledge of her germ friends and foes; and sociology for the good citizenship she must practice, still, all her life long, the deftness of hand she has learned in the sewing room, at cooking or dining table, at chemistry desk or with the microscope, will enable her to work out her ideas, and only because of that deftness will she be able to carry forward the strong work she delights to manage.

The training of heart comes to the child we are training for life's battleground from his earliest years, but it is a training like that given for bringing sweet music from the stringed harp—it must be continuous. The practice must never be neglected. Much of this training comes through the influence of the church, for no matter what name it carries—Catholic or Protestant—it has a saving hold on the deepest inner being of its adherents. No grip is so hard to shake off as that of early religious convictions. "The still small voice coming down from the time when the shepherds watched their flocks by night" in old Judea echoes yet in the cathedral, church and open-air meeting. It gently, if mysteriously, imparts to human life the distinctive quality which is the best exponent of our civilization of today.

"Upon the nature of the child it makes an impression that forever afterwards exhales a fragrance and blends his characteristics into a power for the saving of the nations." The cultivation of heart means the training that gives power to be a real helper in all good work of the world. It means that love for God and love for man is cultivated in each life and that every day's work exemplifies the human helpfulness such love gives. It means that to be a clean, strong, earnest Christian man is the aim of each well educated American boy, and it gives the power to carry the womanly influence that may move the world to every girl who has been given her due. Above all, it means honesty. Not only the reputation that is above stealing a neighbor's purse or his chickens, but the honesty that will protect a neighbor's good name and that will earnestly strive to uphold the standards of right living before the neighbor's boy.

Many feel that a school is not responsible for character building; that those teaching older pupils particularly must teach their specialties only and let all other work alone; but woe to the instructor who fails to hold up lofty ideals in the class-room every day. The teacher who fails to give an example of earnest, faithful work, who neglects the opportunity given him to help the student, not only to find the fact he seeks, but also to grow into better thought about standards of living and into stronger Christian character, has forgotten the best of his work, and it were better for him if a millstone were hanged about his neck and he were cast into the depths of the sea.

Do you say the mother will ask too much who demands all this from the school where her child sits five days in the week, thirty-six weeks of the year? Can mothers ask too much for their children? Can they begin to give as much as they wish during the years from seven to twenty-one?

When a child goes into school he is a dependent, almost helpless creature of circumstances, and when he leaves the school life he is ready to take his place as one of the world's workers. The mother who asks most of the school is willing to give most of herself, and the interest that gives her wisdom to ask definite help of the school will lead her to visit the school often, to know the teacher well, and to keep herself closely in touch with all the school tries to do.

No parents who neglect the school have a right to ask anything of it. But the mother who earnestly strives to do her part has a right to ask that the school training shall be such that her child shall grow into a fully-rounded man or woman, with well-trained head, hand and heart.

The next thing on the program is a pantomime by District No. 84, entitled "Home, Sweet Home."

Pantomime.

Chairman—We have a long program, and as this will be a rather long encore, we will dispense with it.

We will now have two songs by the Girls' Glee Club of the High School.

Chairman—A British scientist has said that unless the women put into practice all the knowledge that is gained in the laboratories, at so much expenditure of time and money, regarding the knowledge of living and sanitary science and all that pertains to our physical well-being—unless a woman puts it into practice, it will be of no value to the world; that they alone are the ones who can do it. How shall the women put it into practice unless they know it—unless they are taught it? And how else shall they be taught it except in our public schools? It is not for the few who go to the universities or some of the high schools, but the masses who must put into practice a better and more wholesome way of living, better foods, better-cooked foods, and cleaner homes. I don't mean the swept-up floors. I mean the sanitarily clean. This knowledge ought to be taught to the girls, or, when they are housekeepers, how can we expect them to do better than the homes in which they grew up unless they are taught? For this reason we wish to have it in our public schools; and realizing this, this organization has stood for domestic science in the public schools, and a year ago we agreed that this should be the one thing for which we should work hardest, and that this year every program we had anything to do with should have this topic upon it, and we decided that today the whole of the program should tend in this direction. We have with us one who has been experienced in teaching it in our public schools for some years, and he is to talk to us now.

TEACHING DOMESTIC SCIENCE IN THE SCHOOLS OF ILLINOIS.

(By Superintendent Joseph Carter, Champaign, Ill.)

For more than twenty years there have been sporadic efforts at teaching the household arts in the schools of Illinois. But not until that spirit that believes in applying the discoveries of science to the common affairs of life—a spirit which led to the establishment of this farmers' institute—spread abroad in the land did the feasibility of teaching domestic science in the public schools become apparent. Now the desire for that teaching is rapidly growing, Moline, Galesburg, Streator and LaSalle have just started it; and Bloomington and many other towns are studying ways and means of doing so. The public schools of Chicago have had some features of the work for some time. There is record of but little having been done in the rural schools. Three obstacles seem to prevent its general introduction into the schools of the State: First, a lack of understanding as to how easily and inexpensively it may be done; second, an ignorance and an apathy on the part of parents, and the public generally, in regard to the whole matter; and third, a lack of teachers willing and prepared to undertake this work.

TEACHING DOMESTIC SCIENCE IN CHAMPAIGN.

Because I know more about the schools in my home town than of any other schools in Illinois I will ask your pardon for speaking more fully about them. The teaching of domestic science in the schools of Champaign had a modest beginning. By subscription $55 was raised. With this a room of ample size in the high school building was supplied with five tables, each table fitted with drawers and molding boards for four pupils. In each drawer was put a case knife, fork, paring-knife, tablespoon, teaspoon, egg-beater, wooden spoon, measuring cup, salt, pepper and flour dredges, saucepan, pudding mold, mixing bowl, small granite pan, vegetable brush, biscuit cutter, strainer, china bowl, vegetable dish and a rolling-pin. In a cupboard, for use by all, were 5 large pans, 10 bread pans, 5 double boilers, 5 small frying pans, 5 iron griddles, 12 plates, 12 sauce dishes, 12 cups and saucers, 5 baking pans, 2 large granite kettles, 2 potato mashers, 2 colanders, 2 meat platters, 3 muffin pans, 10 dish pans, 12 glasses, a grater, steamer, small coffee-pot, teapot, and a flour bin and sifter. A manufacturer of ranges donated a first-class kitchen range; and the city gas company gave a gas range. Thus the school kitchen was equipped with an expenditure of $55. Its value and importance were at once recognized by all its patrons, and its popularity was quickly established. This was five years ago. Since then year by year more utensils have been added, and other equipments supplied—last year a continuous work table for 20 girls, with a complete outfit, including a little gas stove for each—till now the domestic science room is a complete laboratory-kitchen. The entire cost has not yet reached $350.

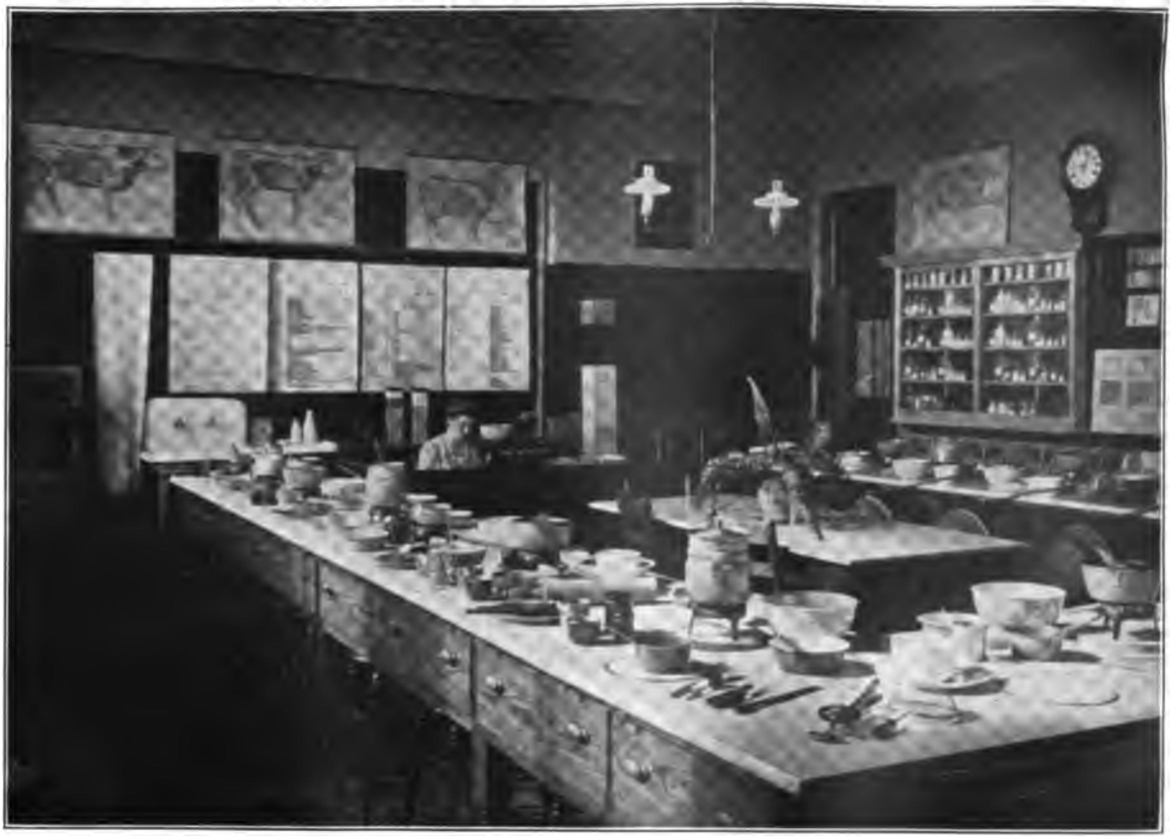

Plate XIV.—Domestic Arts Room, Champaign High School. (By courtesy of Alfred Bayliss, Supt. of Public Instruction.)

WHO TAKE THIS WORK.

This course is taken by all the girls of the eighth grades of the ward schools and by the girls of the freshman class of the high school. There are two lessons each week. Each lesson lasts an hour and a half, usually; but on days for bread making and some other subjects the lesson is three hours long. A regular text book is used, both to study and as a laboratory manual.

THE COST OF THIS TEACHING.

A competent teacher was employed by the school board to take charge of this work and also to direct the sewing in the lower grades of the ward schools. She was paid $35 a month at first and is now paid $70. The cost of the material for the cooking and sewing in the high schools—for the girls are taught sewing—has never exceeded $1 per year per pupil, and the cost of material and the salary of the teacher added has not exceeded $3 per year for each girl.

WHAT WAS TAUGHT THESE GIRLS.

These girls were taught the principal ways of cooking, broiling, roasting, baking, boiling, steaming, frying, braising and the like. They were taught the chief classes of organic food stuffs; proteids, fats, and carbohydrates. They were taught the functions of food; its relation to life and growth. They were taught the practical points of feeding a family. They were taught to select proper foods—those suitable to the season, and to the age, and the occupation and the peculiarities of the eater. They were taught the importance of providing a "balanced ration," and were made familiar with the tables—prepared by the United States Department of Agriculture—showing the chemical composition of foods.

FRUGALITY WAS TAUGHT.

They were taught that food is not necessarily nutritious in proportion to its cost; that a cheaper cut of meat properly cooked and nicely served, may be made a full substitute for a much more expensive cut; that plant proteids may well take the place of animal proteids—for instance that peas or beans served with a small portion of meat may take the place of a much larger one and at a considerable saving in the cost of the meal. They were taught how to supply, for one kind food which is too expensive, another kind equally nutritious, which is cheaper. All through the course they are taught frugality and economy so that of none of them may it ever be said, "She can throw out with a spoon faster than he can throw in with a shovel."

DOMESTIC SCIENCE MEANS MORE THAN FOOD.

It also means a study of the home; of its healthfulness, its sanitation, its plumbing and drainage. It means a study of its warming and ventilation. It means a study of the house, in matters of convenience and appearance, as well as its interior furnishing and decoration. It means a study of clothing, as to its durability, healthfulness, costliness and appearance. Finally, it means everything material that goes to make up a home, to all of us, the dearest, happiest place on earth.

DOMESTIC SCIENCE IN THE PRIMARY GRADES.

In the Champaign schools domestic science in its simpler forms begins in the first primary grades. The same teacher who has charge of the work in the high school supervises this work. It begins in the first grades with a coarse darning needle and colored yarn and perforated card board, and with scissors and paper. [Here the speaker exhibited specimens of this work.] In the the second grade they use a very coarse needle and coarse thread, and railroad canvass and burlap. In the third grade sewing is done; many little articles which the children wish to have, are made. In the fourth grade quite complicated work is done, including the various stitches and the finer patching and darning. Twenty schools including nearly a thousand children do this work. It began in 1898. The cost of material has never reached 20 cents per year for each pupil. Boys and girls are given the same lessons, and no other school work is so generally enjoyed as this.

THE PURPOSE OF THIS TRAINING.

The purpose of this work is threefold: First, and least important of any—though this is by no means unimportant—to teach all children to sew. Second, to give the little children, before they are old enough to study, some employment—busy work the teachers call it—something which they can easily do, and the doing of which shall not be valueless, as is most of the busy work for children. This keeps them from the mischief which idleness brings, "For Satan finds some mischief still for idle hands to do." Everybody has observed how constantly active are the hands of a healthy child, and how contented and happy he is if his little hands have something to do. No child should ever be trained to sit satisfied with idle hands.

Third, to train the child's hand. This is the chief purpose of this work in the lower grades. Consider what the human hand is: It is composed of 27 bones and a multitude of muscles. Its power is stupendous and its delicacy marvelous. It is the most skillfully designed and constructed apparatus ever made for accomplishing an immense variety of different kinds of work. It is connected with the brain by thousands of delicate nerves. The area of the brain which is connected with the hand exceeds any other specialized brain-tract. Of the more than 600,000,000 brain cells a very large part are immediate connection with the hand. Hand culture then is brain culture.

The hand is important in all those matters which raise us above the barbarian. Destroy everything about us which is the work of a man's hand, directly and indirectly, and the earth will be a desert or a wilderness. We can maintain our present position among the civilized peoples of the earth only by maintaining our superior manual skill. Not our lawyers, nor our linguists, nor our literary men give us our industrial supremacy in the world, but our skilled mechanics, our trained engineers, and the deft fingers of our artisans.

But, do you ask, "Do you teach the boys to sew?" Certainly, why not? Is it not as important that a man should have skilled hands as that a woman should? There is nothing especially manly in clumsy hands. Such hands show lack of training. A baby boy's fingers are no more clumsy than a baby girl's; the difference is made later by difference in training. There is no reason why the tieing of a necktie should bring either perspiration or profanity more frequently from a man than from a woman.

This fact should be remembered:—Unless the brain cells which control the delicate muscles of the hand and of the fingers, are called into activity early in life they become atrophied—useless and unresponsive to the will—and can never again move nor control those muscles. Hence children in school should be trained to use not only their hands, but their fingers also. The pencil and the pen used in figuring and in writing, because the hand is used as a whole and because there is so little variety in the movements, do not give the fullest training, and so the needle is used. But it does not matter very much upon what the hand is trained, perhaps there are other instruments as good as the needle. If it once becomes skillful with one instrument that skill is easily applied—adapted—to any other instrument; for it is the brain that receives the training, and it is the brain that controls the fingers in all their movements. True, "The pen is mightier than the sword," but a cambric needle is an emblem of a higher commercial and industrial development than either.

At the end of the fourth year the work of the boys and girls differentiates. The boys finally go to the manual training classes, and the girls go to the domestic science classes as has been described.

WHY THIS TEACHING IS DONE.

Why it is done for the boys is already told. For the girls it is done for the training in home making—for the home. First—Because the home is the unit of our social organism—of our civilization; because all civilized men live in families and in homes; because every one of our purest and sweetest joys of youth, of adult life, and of old age, are clustered about our home; because every foretaste we ever can get of heaven, here upon earth, has its origin in the home; because the very continuance of our race depends upon the maintenance of the home and family; because of all these and a multitude of other reasons, the schools of Illinois should teach the art of house-keeping and the science of home making.

SECOND, TO TEACH THAT HOME AFFAIRS ARE IMPORTANT.

The girl who goes through our average school is liable to get an idea that the matters pertaining to home life are of small importance—is likely to look upon housekeeping with indifference, if not with contempt, and the better and more thorough the school—in the common acceptation of the term—the more likely is this to be the case. Teaching housekeeping in the school, giving it excellent appointments of room, of material, of apparatus, and an excellent teacher, and putting it upon a plane in proportion to its importance in life, gives it a new and a higher rank in the mind of the young woman. Housekeeping, then, appears to her as a science quite as well worth her time, and quite as valuable in the line of mental discipline, as any other study in her school course. It keeps her in harmony with home life and gives her a warmer sympathy with its affairs.

THIRD, IT GIVES AN OUTLET FOR SURPLUS ENERGY.

Many a girl is made a trifler, a butterfly, or a highflyer, simply because of super-abundance of energy for which no suitable outlet—no point of application—has been provided. Giddy, heedless girls often have the very best hearts, and kindliest impulses; and when they have gone wrong it is generally because their native energies were never coördinated with the affairs of home life. Every normal girl hopes to be, some day, the mistress of a well-kept home. All little girls play "keep house." This is as natural as for the bud to bloom or the bird ro fly. Putting this domestic science work into the school meets the expectation of the girl's life, and gratifies her natural ambition as does no other school study.

FOURTH, BECAUSE OF ITS HIGH DISCIPLINARY, EDUCATIONAL VALUE.

No other school study squares so exactly with well established pedagogical rules as does domestic science.

WHY TEACH THESE THINGS IN THE SCHOOLS?

Do you say, "We grant the value of all this teaching and training, but why should the *school* give them? Should not the *mothers* do that?" The State, by its compulsory attendance law of 1897, takes the child from home at 7 years of age, and for seven years and possibly for 12 years, keeps him in school, keeps him away from the daily work of the parent—permits no one else to give him employment—holds him aloof from all the activities, and the industries of the busy world. With a perfectly arranged school system, and the strong spirit-of-the-corps which pervades every school, the mind and the soul of the child are completely absorbed by his school duties. In the morning he is in such haste to go to school—for tardiness is an unpardonable sin—that he has no time for chores even. In the evening he is so busy getting the lessons for the morrow that he has no time to perform, well, any of the home duties; and at night—well, he is a fortunate child if his sleep is free from a nightmare of school tasks. Thus during the formative period—most precious of all the periods of a child's life because it is the habit-forming period—the State takes charge of the child to teach it. Is it not the duty of the State to give the child that teaching, and that training, which will be most necessary for success in adult life? If the State, under severe penalties for disobedience, compels the parent to keep his child in school all through those years when it is quickest to learn, should not the State give to it all that training which any good and wise parent would give?

MANY MOTHERS CANNOT TEACH HOUSEKEEPING.

Besides the fact that there is not time for them to do so, many mothers cannot teach their children these things because they cannot themselves do them. Many mothers cannot sew well nor cook well, and their children should be taught to do better than their mothers can. Many of the women of foreign birth were reared as field, or garden, or dairy laborers, and now their hands can never be trained to delicate work. Among the native born are large numbers, who from lack of early training, are equally inefficient. Then there is a great mass, especially in the cities, who have so little to do with, that any teaching they could give would be wofully deficient, and yet by these masses the greater number of children are reared. In the homes of the well-to-do many mothers, because of their other duties, real or artificial, cannot find time to teach their children. In many such households the cook would give instant "notice" if the mother came to the kitchen to give the daughter lessons in cooking. But if the mothers, generally, had the time, the disposition and the knowledge for this teaching, they would not succeed very well. They are not trained teachers; they do not understand methods of teaching; quite generally their children are not very obedient to them; there are many interruptions and distractions; the atmosphere of the home, where so many other things are doing, is not suitable for teaching, so that the progress is of necessity very unsatisfactory.

At school all this is reversed. The teacher is trained to teach. She underderstands methods. She also understands children—often understands them better than their mothers do. She has the habit of controlling, and in the school room children have the habit of obedience—the spirit of the school favors that. There are no interruptions and few distractions. The atmosphere of the school room is congenial to learning, so that a trained public school teacher working with 40 pupils, half an hour daily can accomplish more than could be accomplished by 40 mothers working twice as long, using more energy, spoiling more material and wearing out a great deal more patience.

If any teaching is to be done at home by the mothers, let it be reading, writing, spelling and grammar. Many mothers can read and write and spell better than they can cook or sew—that is, their knowledge regarding those school duties is much nearer up-to-date than is their knowledge of the household sciences. Within the last 20 years, by studies in the laboratories and by experiments in dietaries, and by research in many fields, many discoveries have been made, and many valuable facts have been learned, till there is now a great mass of household knowledge with which few mothers are familiar, and with which for various reasons they generally cannot become familiar, and which should be taught to the children. How many mothers know of the presence in their kitchens of the living organisms which aid them in bread making? or of those that sour the milk? or of those that "ripen" the cream and give to good butter its delicious aroma? or of those that give to rancid butter its vile taint? How many know the chemical changes which take place in the oven? or of the difference between a boiled and a baked potato? How many are familiar with the germ theory of disease, so that they can safeguard their children, not only through an epidemic, but all the time? How few realize, how at all times, on all hands—well or sick—we are constantly near these organisms, some of which work for our good and some for our undoing' How few mothers know these things; and if we do not teach them in school when shall we ever have a generation of mothers that does know them?

My friends, as a matter of fact, do not you know that a vast number—perhaps a majority—of the young women of this country are growing up with a very inadequate training in all the arts of home making? Do you not know that, year by year, multitudes of them are starting out in homes of their own with insufficient knowledge of how to make a home, unable to help economize, and to help accumulate that competence which every young couple in this land of plenty has a right to expect. There ought to be no poor people in this country, barring accident or grave misfortune. There ought to be no homeless people. Every family should live under its own roof—a roof for which it has paid, or is paying. They all should have courage to aspire, at least, to that. But, alas, many do not. And many who have homes wreck them. From the Chicago Record-Herald of Dec. 12, 1902, this is taken:

"POOR COOKS CAUSE DIVORCES.

"Poor cooking and housekeeping was the underlying cause of the severing of the marital bonds of more than 400 couples in Chicago last year, according to Mr. Ernest P. Bicknell, general superintendent of the Chicago Bureau of Charities. These cases actually came under his notice in the pursuance of his official duties. Lax methods of housekeeping on the part of the women formed the cause, in each case, for their desertion by their husbands. The wife would then apply for divorce on the ground of desertion, though primarily she was responsible for the trouble. Each of these cases came to Mr. Bicknell's notice through the application to the bureau of charities for assistance."

Who is to blame for this? Perhaps not the deserted wives—though they must bear the misery and the disgrace of it. Is it not the faulty and deficient education, which has failed to train them wisely, greatly to blame?

CONDITIONS HAVE CHANGED.

Some of you will say: "Our generation never had these things in school. Aren't we all right?" Yes, some are. But you were reared under circumstances quite different from those under which your grandchildren are now growing. When the old men of today were young nearly all the implements were made by hand, upon the farm or near by. Harness, wagons, plows were repaired upon the farm. Every boy had ample manual training. When you older women were young, sheep were raised for the wool, which you saw carded, spun, woven, cut, fitted and made into garments. You had a part in much of this work. The parents of some of you could do every part of it. The food you ate was, almost to the last mouthful, produced and prepared at home. From children reared as you were has come the most virile race—the most dominant race—that ever trod the earth. The products of your enterprise, of your ingenuity, of your resourcefulness, are in every market of the world. Every foreign producer dreads the invasion of American made goods. But how is it today? Though you produce the raw material, you send nearly all of it off to be prepared for your own table. You buy your raw meat from the butcher, and your embalmed from the grocer in tin cans. Though you raise the hides, you buy your shoes from the storekeeper. Though you raise the wool, you need card, nor spin, nor weave, nor cut nor make it. Nearly everything comes ready made. Even the women's dresses, both the dear and the cheap, and her aprons and sun bonnets come from the bargain counter. Can you not see that the children of today can get little of that training which made their grandparents so resourceful unless they can get it in the schools? Where is the young woman who can do one-tenth as much toward supplying everything upon the dinner-table as her grandmother—everything from the table-linen, the bread, the butter, the meats—bacon, ham, sausage—the preserves, fruits, puddings, pies—O, it makes my mouth water to think of it all! Do you know why there has been less advancement, generally, in the work of the home and the kitchen during the last fifty years than in any other kind of work? Is it not because no effort has been made to educate for this work? Do you know why nervousness, dyspepsia and indigestion are so prevalent? Is it not, generally, because the cooking is inferior? And why? Because we have inferior cooks, and this, partly, because we treat them as inferiors. Being treated and looked upon as inferiors has made housekeeping to be considered as not a noble occupation. This has led many capable and ambitious girls to prefer clerking, stenography and similar vocations. This, too. has changed our ideals. Fifty years ago the first women of the land were proud to be known as good housekeepers and good cooks. Now many who are both are not pleased to have the fact mentioned in the so-called "best society."

THIS TRAINING WILL ENNOBLE HOUSEKEEPING.

To give all housekeepers a scientific training will give them a much higher social standing. Giving those who engage in any calling a special education raises that calling to a higher rank—sometimes makes a profession of it. In the early days of Rome those who practiced the healing art were uneducated slaves. The title of physician was given them because to give physic was all they knew, but when those who followed this calling became highly educated their profession took the highest rank. Giving nurses a special training has given them a new and exalted position. So it will be with housekeepers. To the ignorant, untrained person all his work is drudgery, but give him a special education for his work and it becomes a joy and a pleasure. That is the difference between a rock breaker and a geologist; between the clod hopper and the scientific farmer; between the scullion and the educated cook. The former goes through life like a tramp shut in a box car, the latter like an intelligent tourist in the look-out of an observation car. The occupation of the former produces narrowness, disgust and despair, of the latter a wider view, and an ever broadening hopefulness.

There are so many, many studies, and delightful problems in the home, in every day work, that a woman who is fully alive to them need never lack for what is entertaining and valuable—valuable for her housekeeping, and valuable for her best and highest intellectual development. When all housekeepers are adequately prepared to make our homes what ideally we know they can be—else we would not sing, "Heaven is my Home"—then we will unconsciously give them that courteous respect, and that high honor, to which they will be justly entitled, and which their valuable services show to be their right. And to them their lives will be one of generous nobility—this whether they are our wives or our daughters, or whoever does this most useful work.

IT WILL NOT LESSEN THE AMOUNT OF OTHER SCHOOL WORK.

Do you ask, "If domestic science be put into the schools will it not diminish the amount of other school work that may be done?" It does not seem to do so at Champaign. The four hours a week given to these studies, because they are so different from the others, serve a pleasant rest, and seem rather to increase the amount of work that can be accomplished in the regular school studies. But suppose it should sometime happen that it would reduce the amount of conventional school work that can be done, if there is not time for all, if this is more valuable than some of the things we are now teaching, wouldn't it be better to omit some of the less valuable ones? Take the country schools—how much time are you wasting on technical grammar, of which Professor Whitney says, "No one ever learned to speak good English by a study of grammar?" Or how much time are you wasting trying to teach children composition when their heads are empty of anything to write? Or what about the fearful waste of time working arithmetic?" Anybody can learn enough arithmetic—presented at the right time and in the right way—in two years at school to do all the business that is ever likely to come to her. Or take the city high schools: For the average woman—for the majority of women—which is likely to be of greater value, domestic science or algebra?

or geometry? or Latin? or German? or Greek? or literature? If domestic science should crowd out algebra—it is usually taught five terms in our high schools—who would be the loser? How many women in this audience, unless they are teaching it, have any use for their algebra? And literature, what, as usually taught, is its value? "It teaches us to write," do you say? Wouldn't you do the world as great a service by inventing a new game of ping-pong as by writing a novel? Aren't there already too many novels?

But we have not found it necessary to drop any studies from the school course at Champaign. All the girls take them all in the fullest measure, and they also take domestic science. We have found that teaching a girl how to prepare sauer kraut does not unfit her from reading Goethe; nor does an understanding of the philosophy of Bacon unfit her for serving most deliciously a toothsome bit of side meat. Because she is fitted to fill a useful sphere in life she is none the less able to make spherical geometry. Knowing the subtle qualities of Castile soaps lessens none of the pleasure in reading Cervantes; nor does an understanding of the minutiæ of house-cleaning destroy her faith in the atomic theory.

HOUSKEEPING IS A GREAT BUSINESS.

The business of housekeeping is the greatest business in the world. More people are engaged in it than are engaged in any other occupation. More capital is invested in it than in any other business. Its yearly expenditures exceed by myriads of millions, all the expenditures of the armies and navies of the world. There is no interest of greater importance to more people than this. It helps make or mar the happiness of all civilized men. When it is done well men are happy all the day long, and all their slumbers are peaceful; done badly and their days are nervous and their nights without rest. Done well and the family is the most blissful group of people on earth; done badly and none stay at home who can elsewhere go. Isn't it passing strange that this business, which is both a science and an art, which lends itself more readily to the teacher's art, than any other subject, should be so totally neglected in most schools? Isn't it marvelous that while we know that probably more than 90 per cent of all that the toiling millions of this land earn each year is spent in clothing, feeding and housing themselves and yet we make no provisions in our schools for training the for doing these things? Men toil on farm, in shop and in office all the day long; they plan and calculate and economize—and for what? Almost entirely for their families at home. Is it not curious that while we know of so many people who are sick or ailing, and that we do know that nearly all of these ills come from defective home living, yet we give no special training to those who are to be our home makers? My friends, "What fools these mortals be."

"Home, home, sweet, sweet home." Few other words touch so many heart strings. And yet how little training do we give the children to enable them to realize such as a home. Nor is that the worst of it. Much of the education that we do give them unfits many of them for either making or enjoying a home. We all do hope that every one of our girls will some day have the happiness to have the care of a home. We do know that for this high position they should have a special training. Let us here determine that this education shall be afforded them in the puclic schools of Illinois.

Chairman—Mr. Bayliss is in Cincinnati at the State Teacher's Business meeting. He was on our program and should have been here last evening, but he is not to blame for not being here. Usually this meeting has come one week before that and when he promised to be on both programs he thought of no conflict. I told him to go and I would explain why he was not here.

The next on our program is a discussion by Professor Felmley on "The Training of Teachers in Domestic Science."

Professor Felmley—When I was asked by your secretary to talk to you today 10 minutes on the subject of "Training the Teachers for the Teaching of Domestic Science," I told her I had no experience in this sort of thing, but she insisted that something must be said and it was my duty to say it.

I have made as careful a study as I can of the various schools in the United States and of what is being done in them in the training of teachers for this particular sort of work. Everyone who has paid any attention to the history of educational matters has noticed that we have gradually added to the three R's, civil government and the law, art, music, manual training and natural science and now domestic science. In doing this there has always been one procedure, a long agitation demanding that it be placed in the schools and after a time some man of wealth comes along and is interested and there is founded at some school in which people have the means to study the problems in the new proposed branch. It takes a long time to bring it into form to arrange the laws and forms to make it practical in the school room and under school conditions. Some of you will remember it took between 30 and 40 years to hear natural science in the schools with Agassiz at Harvard and it was out from Harvard there went the men who had the most influence in teaching natural science throughout the United States. In the same way with art, and it was the Boston Art Institute that became interested in the work of Walter Smith of England. In the teaching of domestic science I suppose much is being dene to provide teachers through the endowment that has been given Pratt Institute for this work than in any other way and in the Drexel Institute of Philadelphia I suppose we find the best work in the training of "Teachers of Domestic Science," and they are the teachers doing the work in the normal schools where it has been introduced.

We have listened to accounts of the work at Champaign. All honor to the men and women upon the platform who have done the work in one of our cities in this State. All that is praiseworthy, but they must go a good deal farther than this. In the high schools in the city it is easy to provide an outfit and to arrange the gas stove and the utensils of cooking, but how are we going to have some of these things done in the village schools and the rural schools, which are represented by the members of the Farmers' Institute of Illinois. You must look not only to the training of teachers for the cities but for the villages as well. Of late years there is a great increase in the demand that is made upon the State Normal schools for trained teachers in many of our states farther to the east. It is expected that the State Normal schools must provide for all kinds of learning for which there is a demand in the public schools, and I think the State Normal schools of this State, as well as other states, stand ready to furnish the instructors just as soon as the people want it done. There is always the same difficulty in training teachers in any branch not required in the school system. There is no use of being careful of the seed corn unless you are careful of the soil. There is no use to employ teachers unless they can do the work for which they are trained. We have instruction in art, in music and courses in natural science, courses with special reference to the teaching of horticulture and agriculture in the schools, but when the young people come to us from the country they will say our county superintendent does not examine us in those branches, or the people in the district they come from don't care for anything of this kind, and what is to be done? They do not wish to be put in the classes where they must study music or science. Public sentiment must be started that will ask for these things, then it will be impossible to get the young people to undertake them in any considerable numbers. There are some who see the value of this training and are willing to do some missionary work, but the majority think it is not worth while to keep in stock wares for which there is no market.

Another difficulty in establishing this work is we have to look to the Legislature of Illinois for appropriations and you understand I think what that means. In asking for money I made a modest request for kindergarten and another modest sum for manual training in the normal schools and it was penciled. Why is that? It is simply because your representatives don't believe these things are worth while. They say we do not want the normal school lumbered up with this useless stuff. We want them instructed to teach reading, spelling and arithmetic. If you want teachers trained in the normal schools of Illinois so that domestic science may be taught in the rural schools you must work upon the members ot the Legislature in your several communities. You should also see to it that a teacher prepared to do the work shall receive proper remuneration and support.

I believe it will be easy in our normal schools as in the normal schools of the eastern states where the training of manual science has been a part of the prescribed course of the teachers to introduce this work without in any serious way interfering with the work as it is now. We are vitally interested in it and in all things that may further our survival.

The Esquimaux are interested in the walrus and have canoes which enable them to run down the walrus and catch him and in the preparation of the skin for clothing and tanning it which the women do, and even the children of the homes are interested in the work and so with all primitive people they are greatly interested in all things which make for their survival, and so with the boys and girls of Illinois, it is easy to interest them in the animals and the birds of the air, it is the same interest of the primitive people, the interest that moves directly for his survival. In studying domestic science we want to study the things that underlie it. We know in studying botany everyone will be much more interested if we dwell a good deal in this study upon those phases of the subject that we call the economical use of the plant and know the order of the plants that produce grains the properties of the different orders as the umbellifer from which so many of our plants come that produce condiments, carrots, anise and dill, how to know the properties of the nightshade, the common properties that run through these plants which are the food of man or furnish his clothing. The study of our plants with that in view will add materially the interest of the subject because we see they are closely connected with human life.

In the same way in studying zoölogy to know something of the animals that serve for food, the fur-bearers and the insects we call economical insects, as they depend upon destructive insects for their food. That source of study has not only the general interest, but the vital interest that affects directly our well-being.

We will study in physics the material world around us and the laws that control it. We may not be interested in these sciences and studies of themselves, and yet we are ready to pay attention to the questions that affect the home and health and the problems that are involved in sanitation and the study of chemistry so as to know the effects of heat upon different kinds of food. That is worth a good deal to anyone, and is one of the problems of chemistry. We must know what happens to sugar and flour under temperature, and know the effect of boiling in water already heated or putting a piece of meat into cold water and gradually lifted to the boiling point—the difference that happens to tendons in these two cases.

Then there is a great field for science that has been made much of of late in our schools that is of the highest value in connection with home-keeping, a matter that has been referred to. I suppose that hundreds and hundreds of years ago our mothers and their mothers before them have been breadmakers, and we have learned to bake bread just as the women have always done before—by watching their mothers, by listening to some of their directions; by experiments they learned that it took so long after the sponge is mixed and the yeast is added, and the loaves are placed so near the fire and not too near, and then put into the oven, just so hot and not too hot, and left so long. They have learned this by experience and tradition. and there is no art in doing things when it is merely a matter of experience.

Now we have domestic science, and domestic science aims to tell us why these things are done; so we begin by studying the yeast plant, in order to find the conditions most favorable for its development and know its functions and know the temperature that is needed for the rapid multiplication of cells when added to the flour in order that it may be lightened. Domestic science will give us a knowledge of why we do things as we do, and will give us an exact knowledge of the conditions. The same with churning. as to why sometimes in the hot weather butter will not come, and sometimes in cold; why some days we have to add cold water and some hot. It was a simple matter to introduce the thermometer into the churn and to make the cream adhere when the casien was broken by the action of the churning. And so the science that underlies all household arts cover the whole field of science.

There are some subjects, of course, that become more practical in their nature when it comes to the matter of sewing, but there has been so much said in connection with this in the Champaign schools that I can add nothing here.

If the young women are to be prepared to do that sort of thing how many are the times when the children cannot go out to play that their time can be best utilized in teaching them some things? Let the children prepare in the school houses the lunch they eat at noon instead of the cold lunch as has been the practice of six generations of school boys and girls. This demands special apparatus and I don't think it will be practical unless we get the consolidated schools, to develop the art of cookery to any extent but we can learn the principle that underlie cooking and the children can get the practice at home. They can study all matters that relate to sanitation and health: they can learn something that can be done in sickness and emergencies until the doctor comes. The preparation of food for the sick, poultices and bandages and some of the simpler things in connection with nursing. Not because we shall have emergencies in schools very often yet a good deal can be done in connection with the ordinary study of physiology if the teacher has been trained in these things and should occasion arise they can make the practical application.

There is one thing further that we propose to get in this domestic science work, a better culture in the school. We have made the mistake in thinking the culture is in the far away and not here. When one is engaged in cleaning and has a yellow spot before her, if she knew something of the different kinds of alkalies, borax, soda and potash salts used in cleaning, if she knew what is suitable and what may be used with impunity upon paint and what not to be used without destroying it, if she knows all these things from the study of these subjects then there is an inspiration that comes from her work. We need the intellectual life, we need something to interest us and our culture comes from our knowledge. Work, drudgery and play are three different things. When we find delight in the end and not in the means by which we realize the end, then we are engaged in drudgery. When we have no interest in the means by which we reach the other means it is work, but when we have delight both in the means and the end of the work we are engaged then it is play.

Carlyle has said "Blessed is the man that has found his work, let him ask for no other blessing." That is the truth if we know the forces that are at work in all the various processes in which we are engaged, if we understand what we do and why we do it and if we see the value of every step and understand what is going on in every process then this intellectual demand that is being made upon us as we proceed with our work busies our mind and gives us delight.

I do not know how soon the time will come when we can have trained teachers who will live up to what we are in a measure demanding who will have not only the practical knowledge but the genuine interest in these things that will make branches of study that make for home keeping have the proper impetus. I hope the day may come soon.

Chairman—There are some not on the program who have some things to say on this topic. Mr. Kerrick is one we want to hear from.

Mr. Kerrick—If you want to go because I want to speak I will still ask you to stay. I will not talk long. I am interested in this subject and it is most gratifying to me to see the interest manifested by this large attendance of intellectual people to have heard this subject discussed. If there is not a domestic science we don't want to lose a minute working out one. I feel very sure of that. We are spending State money right now in Illinois and every state in the Union is spending state money to hire teachers to teach us how to feed cattle. We are taking money of yours right now out of the State treasury and expect to take more to teach how to feed cattle, it does look like a reasonable proportion to learn something about keeping and feeding people. And if there is not a domestic science we have got to work one out and we have got to teach it wherever and in whatever way it will do the most good. I don't know that all men are built alike. Perhaps it is better not. But to me the home is the whole thing. I often liken myself to a dog when I am away from home—just as soon as I can slip the halter of the business off I slip it off and run home. That is what was the matter of that dog in here. He heard Professor Carter talk about home and he wanted to get home and I went in there and let him go.

Some day it will be found out that the five or six great sciences are those to raise something to eat, how to prepare it properly to eat, how to raise some kind of materials out of which to make the clothes and how to make them, and how to make a house and how to keep it. Those are the six great sciences and we will find it out. The ladies have got ahead of us.

Now the schools have taught us everything. It looks like we are up to the times when we are bound to know and do some of the things so as to live and maintain ourselves. We are up to this question of domestic science, the rich and the poor and the unemployed, but none of us can escape it. Domestic science lies right across the path of the future rapid progress of this people in everything that will make for great good. It must start, I feel and believe, with home-making.

I have been in a great building filled with eager listening people and have seen the platform filled with beautiful, intelligent young people; there was music and flowers and light and beauty. It was the occasion of a high school graduation. Now I am not here to criticise whatever has been done or left undone by our schools. I have not time for that. This high school commencement was upon a bigger scale than I had seen before. The idea flashed upon me as the speaker was telling us how these trained minds were not ready to go out from the school—and you know the rest. They were going to take care of the world. The idea was one that had been thought many times before but I could not get rid of it as it came into my mind, "Can any girl there make the beautiful white dress she had on, could she prepare the supper she had eaten?" Could one of those boys have laid a brick in the building that was covering us, and a whole lot of such questions as that. Was there any boy that could feed a horse or hitch him up, and a dozen others ran through my mind, and I presume most of them would have been answered in the negative. Yet we were turning them out and they didn't know the things they should know. I had domestic science clear through my college course—save one week of my whole college course—I cooked every meal I ate and made by bed; sometimes I did not make it very beautifully, but whenever it was made I made it.

I am with you ladies and I want to see this thing go. There are some troubles in getting domestic science into the school, but they are not great. They are not insurmountable. They must surrender, that is all. We must make the homes what they ought to be. We don't want ignorant people running them. We can't. The most interesting, the greatest and the grandest and the best things circle about the homes. Professor Felmley knows it is so. Professor Carter, who is so able and entertaining and who can say so many things, and I want to congratulate him, and the remark I made I spoke for the truth, I didn't try to be funny. It is too serious to try to be funny about. But I am going to tell a kind of a funny thing that I saw and heard in a house where there was a young lady—you needn't jump at conclusions, it wasn't because there was a lady—the mother was very ill and she had not taught the child about hosekeeping. It was time for the plums to be gathered and one of the trees had been gathered and brought in. They couldn't eat them all that day and the girl didn't know what to do with the plums. She was a graduate of the high school and had attended college some and she didn't know what to tell the girl to do, so she had to go to her mother on the sick bed and ask her. The mother thought she might never recover. She did. So she said to the girl stew part of them, can four or five cans and preserve the rest and meet me in Heaven my dear child. The poor woman knew little about the business and the daughter knew less and she got all mixed up.

I have been asked at this time to offer a resolution on this subject:

Resolved, That it is the sense of this meeting that domestic science should be taught in our public schools.

I move the adoption of the resolution.

I second it.

It is moved and seconded that the resolution you have heard read should be adopted. Are there any remarks?

Mr. Hostetter—I want this resolution adopted by a stronger vote than we had on the women's building resolution. If the chairman will excuse me just a moment, I want to correct in the minds of the farmers here an impression created by Prof. Felmley—at least it was in my mind—that we would have to wait for a philanthropist to endow some institution where we could prepare the teachers for this work. I want to say on behalf of the farmers of Illinois, we do not have to wait. There is a perpetual endowment in the farms of Illinois, the soils of Illinois, and all we need is to create a sentiment—a public sentiment in favor of this resolution and in favor of this subject, and the Normal schools will get the money and see that trained teachers will be forthcoming. He said they could not do certain things at the Normal school because they did not have the means. Why not? Because there was not public sentiment strong enough among the people of Illinois demanding that it should be done. We have been creating public sentiment in 102 counties in Illinois through the Farmers' Institutes in favor of home-making and the teaching of those things in the schools which tend to make our boys and girls home-makers and home-keepers and to multiply the number of happy homes many times. Another center that is creating public sentiment on this line is the University of Illinois and the College of Agriculture, especially the domestic science department in that institution.

There was a resolution before us that was intended to enlist another organization supported by the State—the Illinois State Board of Agriculture—and make it a center for generating public sentiment in favor of teaching domestic science, by giving instruction to young women at the State fairs.

You certainly did not understand what the women's building on the State Fair grounds means, or you would have given the resolution a more hearty vote.

The idea of the women's building on the State Fair grounds is a grand one. The women's building should represent the State's appreciation of the value of the home. It should typify in its architecture and its furnishings a man's veneration and love for his mother, the husband's love and tender affection for the comfort and happiness of his wife, and the farm boys' pride in his ability to protect, care for and honor his sister and his best girl.

The women's building should stand out prominently an object of adoration and admiration to every man who attends the State Fair. It would become the Mecca where women from all parts of Illinois would meet annually to visit, consult, receive instruction, and gain inspiration and strength for the work of home-making and home-keeping. It should contain a model kitchen, sitting-room and bed-room, neatly and ecomically furnished for comfort and health—object lessons for would-be home-makers who have ample means for home making in the earnings of their own hands and brains. It would be the one place on the fair grounds where men would take off their hats and throw away their cigar, that they may pay due respect to our mothers, wives and daughters.

I hope when you give this vote, now when called for by Mrs. Carter, your chairman, that you will give it with such a ring that it will be heard at Springfield and echoed in every county in the State.

Are there are other remarks? Question.

It is moved and seconded that the resolution be adopted. All in favor signify with the usual sign. Contrary. Carried.

Chairman: But I want to tell you we are going to have it in our schools whether you men think it best or not. We women have made up our minds.

The next is a violin solo and this closes our program.

We are obliged to you for staying so long with us. You are adjourned.

THURSDAY EVENING SESSION.

Mr. Kerrick presiding.

Now the hour has arrived, and we are somewhat passed it, when the evening program should be begun. Before introducing the speaker of the evening I am requested to say that he will finish in good time for any to reach the Big Four train east at 9:30.

I have the pleasure of introducing Dr. Charles R. Henderson of the University of Chicago, who will address you on the "Social Progress of Rural Communities."

Dr. Henderson:

SOCIAL PROGRESS OF RURAL COMMUNITIES.

(C. R. Henderson. The University of Chicago.)

The scope of this institute is broad as human interests, for you study not only the technical questions of farming and stock-raising, but also domestic economy, markets, schools and legislation. You do not expect me to attempt to give instruction in your craft and art, but your committee has invited me to speak as a student and teacher of social science. My boyhood was largely spent on a farm, under the wise guidance of a father who did not believe in idleness as a mark of worth or gentility. The interest in rural life has a deep root in my memory and experience, and when I was asked to organize courses in the university it seemed to me that the rural community had too little attention. City life has been more diligently studied and its social problems discussed, and yet a majority of our people do not live in cities. So far as I know, mine was the first course offered in the sociology of the rural community, although, of course there has long been rich discussion by the economits. There is also abundant and growing literature on the pure and applied sciences which have to do with farming as a business. But humanity can never think that wealth and welfare are synonymous. Wealth is only a "preliminary item," a material basas for welfare. Practical sociology studies welfare in its broadest sense, its laws and the methods of promoting it.

The world is coming to see that there is a way of securing prize people as well as prize hogs, and that the former is, in the last analysis, the real business of society, in country or city.

What are some of the agencies which are at work to improve the condition and character of life in the country? Much overlooked is the service of the men who devote themselves to pure science and follow truth whether it leads them without considering consequences; rather believing that the consequences can never be evil but must ultimately be good. Every chemical and physical laboratory in the world is busy with abstract laws of matter and force, far remote from any thought of useful applications. These are the men who are not popularly known. Their names are hidden from the world and only learned men in particular lines can even appreciate the value of their labors. Let us not forget them.

Inventors are more in the public eye, although they really borrow their ideas from pure science. America has a genius for practical application of physical science to everyday uses. Inventors are spurred by desire for fame and fortune, are protected by liberal patent laws, and so risk much to gain what all healthy minds crave. They give us telegraph, telephone, electrical engines, labor saving machinery.

Our richest inheritance from the past is not material things but ideas. Ploughs, rakes, barns, bridges, and all other physical objects soon lose value or disappear, but science and invention are spiritual facts and prolific as they are enduring. Sweep away all that men have built with their hands and the nation which has knowledge and arts will recreate it all with vast improvement. The city rises out of its hot ashes more splendid than before, because the energy and skill and arts which are never lost enable them to recover victory from defeat. Most of our wealth is not patented, not copyrighted, not recorded in deeds.

Our national government, especially since our own great Lincoln's memorable acts, has helped to organize the agricultural resources of this vast continent. The experiment stations connect pure and applied science and help to place the knowledge of universities at the service of farmers. Men talk knowingly of "paternalism." What can they mean? Ours is not a government of some paternal human king. Our governments derive their powers, their means and their authority from the people whom they are created to serve. The people have come to realize that government belongs to them and may be used for any common measure which is desired by all except the selfish. They will not be frightened by any cant about "paternalism."

The State government gives an agency through which the agricultural population may help itself, not only in repression of crime but in the furtherance of education, science, art, comfort and happiness. The noble State University, under enlightment and progressive leadership, provides a central meeting place for theory and practice, for scholarship and business. This farmers' institute, under the strong and steady patronage of the State, has entered on a career of vast and abounding hope for every interest. The free public school system is also a form of "State socialism," in the good and reasonable sense, and provides elementary culture for the rising generation. Farmers' organizations of various kinds have revealed a power of voluntary coöperation which is full of promise. In these societies the personal interest is subordinated to general welfare, and enthusiasm for a great cause is kindled and sustained. Intelligence is fed and disciplined by discussion.

To come nearest home, it may be added that the business of the farmer offers, from infancy to age, a school of intellect and character. It is varied, it brings one in contact with the reality of nature, and it compels thought and invention.

The rural church, with all its acknowledged defects, is the most ancient of all the agencies of highest culture for men, women and children. In a free county, without asking support from government, it offers an institution which may be made to serve every noblest aspiration of man. The church refuses to think of men as mere nature objects and as having merely animal wants. It glorifies humanity by its appeal to his spiritual nature, as a citizen of the universe, as an immortal and child of eternity, as son of God. Its buildings are common property and available for sociable intercourse on the highest level of thought and purpose.

The League for Civic Improvement, with its offer to keep us informed as to what is going on in all these directions, may be added to the list of agencies which serve rural communities.

Such are some of the organized agencies which wait the employment of rural communities, many of them rich, powerful, rapidly increasing in resources. There remains the deeper question to be considered: What do farmers themselves want? What is their ideal? What is their steady purpose? For they can get what they strongly desire, so long as the object is reasonably with the limits of economic possibility. Farmers are rich and politically powerful. When they make up their minds clearly and act unitedly, legislatures are in the dust, governors bring out the blandest smiles and doff their silk hats, while politicians obsequiously offer themselves as messengers in lobbies and committees.

What, then, is the essence of progress? How do we know when we are actually moving forward? An elevator boy is moving all day, all the year, up and down, but he does not seem to be making progress. A circus horse may run a great distance around a ring, but not escape from a little circle. Change and movement are not progress.

A community is making progress when there are more riches, machinery and cultural values at its disposal, and when the good things of life are generally diffused and increasingly enjoyed by all citizens. This definition is like an omnibus—it takes every one in and carries the crowd. It is a democratic definition, for if only a small and select class of people are getting the cream, while the owners of cows have nothing but skim-milk, something is lacking.

This general definition may be made more clear if we distinguish some of the elements involved in it. What do we mean by the "good things of life"? Everything depends on our having a vivid notion and determined attitude on this point. Church, school, grange, lodge, family, state, nation can give us nothing until we want it. The old proverb tells all: You can take a horse to water, but you cannot make him drink.

Not to be despised are "good things" in a material sense; lands, flocks, herds, crops. It is the chief business of farmers to produce wealth in its primary forms, to consume a part directly, to hand over raw materials to manufactures to be refined and raised in value, and from the sale of such products to levy tribute on the world for all desirable objects. Wealth getting is itself self control and mastery of nature.

Not only does the existence of farmers depend on success in this business but the population of cities wait for the fruits of the earth from your hands. All social institutions flourish or languish with the conditions of agriculture. It is foolish to speak of business with contempt, as if it were merely a low and earthly thing. In it all forms of good are embodied. It is the chief school of virtue, it is the field of daily and constant duty, it is the discipline of character.

Farmers are certainly making progress in wealth. The history of the calling reveals in 1,000 years an onward march. Nicholson, the economist, tells us the story in an illustration: "At present a fleece of the finest wool often weighs more than the whole mediaeval sheep—bones and all." The farmers of this country have made out of a wilderness millions of homes and estates. Government statistics read like a fairy tale; only that it was the persevering and intelligent labor of our cultivators, not the waving of a magic wand, which brought forth wealth from the desert.

But business prosperity must be considered in relation to the health of the people. It is possible, for a limited period, to achieve economic advance at cost of physical vigor. Where this is true the race as a whole suffers and society bears a burden of inherited weakness, disease and incapacity.

It is in the light of this principle that the farmers of Illinois should consider the effect of building up business of manufacturing by exploiting the labor of factory children. Legislation is largely made by the representatives of farmers, and it is difficult for those who see children at work with their parents, in the open air, with a variety of exercise, all tempered by parental affection, to understand the ruinous results of factory labor of youth. For, contrary to rural conditions, the city child is set to work with a heartless machine whose speed keeps him at high tension for long hours of monotonous and degrading work, he is kept from play and school during his formative years; his work does not lead to a trade, and the taskmaster has none of the protecting sympathies of a parent. Child labor in factory and store is condemned by the most advanced nations and will not bear the light of investigation. The pretense that a rich State like Illinois needed the labor of children, while thousands are long without employment who are able to labor, is based on falsehood, avarice and ignorance.

Nor is it less worthy of note that farmers themselves sometimes purchase lands and herds at the price of health, and that is a bad bargain.

There are two reasons why we should insist that growth in intelligence is one of the "good things in life;" first, because intelligence is necessary to health, business and political influence, and also because it is necessary to completeness of character. There is no occupation which calls for such a great variety of forms of knowledge as that here represented. Every one of the great physical sciences has its revelation of soil, plant life, animal needs and human nature which can be utilized in the care of crops and stock and children.

A population sunk in apathetic ignorance, without curiosity to learn, stupidity satisfied with the wisdom of the fathers, is not living a truly human life. It is within arm's length of the treasures unsuspected. Only to a student of chemistry does the common sod and soil open a wonderful story of truth and order. Only to the student of astronomy do the silent stars sing harmonious music.

I must venture in this presence on another statement, addressed chiefly to men. Here is place for a little speech on "the usefulness of beauty." All that satisfies human desire is "useful" and the desire for beauty is an essential factor in human souls. If this is called "sentimental" we may retort that sentiment is at least half of life, for all except Mr. Gradgrind. Among us it is now the women who keep alive in our homes and sanctuaries this sacred altar flame of beauty. Too often they are discouraged by the barbarious heedlessness of our times.

Perhaps we may touch a responsive chord in the economic man when we remind ourselves that beauty pays, because it adds to the value of farm property. But I am rather ashamed to dwell on this mercenary aspect of so ideal a theme.

Beauty is useful, because it helps to keep the brightest boys and girls on the farm and counteracts the present mad rush to enjoy the disappointing attraction of the crowded and ugly cities. If ever the weary and disillusioned wanderers come back to field and garden, this lure of charming flower, climbing vine and tidy household, with picture, music and verse to feed the deep fountains of being, will have its part to play. That will be a sad day for our freedom when the country loses its best youth, drives them to congested centers, those cannibals of civilization which eat up human flesh.

Beauty is useful to keep men human, to lift them above the level of drudgery, above the coarse rude and unclean.

But is it practicable under our conditions? Are we not too busy? What can we make of this great, fat, level, fertile but often monotonous plain? I dare to build reasonable hopes on memories of my childhood, largely spent with plants and trees and flowers, and on pictures of charming rural scenes which have come under my eyes in Europe and America. The first Paradise was a garden. The most attractive parts of a city are precisely those who reproduce feebly and imperfectly a copy of rural wood and stream. Our cramped parks help us to escape from the din and grime and smoke of daily existence and to imagine that we have been transported to the wide fields where nature sings and smiles.

And here in the long, quiet intervals of hard work, are offered music, poetry and noble prose. Let Lanier, in his symphony and his song of the

Corn interpret to you the neglected glories which are about you. And when the migratory birds fly high over you read by the light of the setting sun Bryant's Water Fowl. In the winter stillness, when the white vestment of snow covers meadow and hill, let the sweet voice of a cultivated daughter interpret to you the songs of labor and freedom and the tales of Whittier's Snowbound. With books at hand we have the companionship of princes. The glittering balls and festivals have no such friends to talk to us as a Shakespeare and the Bible. To enjoy these artists of the race we need not travel, we require little money; only an open heart, a soul that is quick to note and respond to all that is fine and true.

Through all wealth, education, beauty gleams the transfiguring light of the ethical and spiritual, the divine instinct of worship, the impulse which bears us on eagle wings above the common, the low and the selfish. The ideal of progress determines its direction and its rate. What the painter sees in his fancy becomes a reality on canvass. The external edifice exists first as an image in the cells of the architect's brain.

To redeem and glorify our commonwealth which honors itself and blesses the world in holding sacred the name and fame of our own Lincoln, we have only to recall the musical phrases of his grand speeches, his patient appeal to justice and faith, his religious reverence, his martyr devotion to his country; and our children shall enjoy, as we desire that they should, a land made more prolific by our toils and a society more sweet, generous and aspiring for our thought and endeavor.

President Coolidge—This closes the program and ends one of the most successful meetings ever held in America of a like nature. We thank you for your kind respect, for the close attention and the way we have been treated and we hope in the near future we can come again to see you. You are dismissed.

THE CLASS WORK DURING THE INSTITUTE.

The class work was conducted each day as outlined in the program. Those who attended these classes considered them the most beneficial part of the institute program. They afforded an opportunity of getting directly at the instructor and of calling out very valuable personal experiences. The time allotted for class work was fully occupied and often the class was reluctant to adjourn for the general sessions. It was impossible to procure an adequate report of this class work and the accompanying discussions. Much credit is due Messrs. Blair, Samuel and Mumford and their able assistants who had charge of the class work. Those who attended the annual institute will find it greatly to their advantage to join one of these classes and stay by it during the week. The following report of the domestic science class in charge of Mrs. Nellie Kedzie Jones will give some idea of the character of the class work done. We, however, secured only a part of the discussions and none of the names of those who took part.

DOMESTIC SCIENCE CLASS WORK AT STATE FARMERS' INSTITUTE.

The domestic science lessons given each morning at the State Farmers' Institute meeting by Mrs. Nellie Kedzie Jones were most valuable, and that they were interesting was shown by the large attendance of ladies, though the hour was so early—8:30 a. m. The short talk by Mrs. Jones was followed by a general discussion.

HOW SHALL OUR GIRLS BE TAUGHT HOMEMAKING.

Mrs. Nellie Kedzie Jones—Tuesday Morning Session.

There is a very general feeling throughout our country among educated people that homemaking means definite work with definite knowledge. In years gone by a girl was supposed to come to that definite knowledge instinctively. At least she was given no special preparation for the definite work which must be guided by knowledge. Today we are questioning in what way that knowledge may be given to the great mass of girls who will in a few years be the homemakers of the land. There has been in the past a definite feeling that the mother in the home ought to teach the girls in such a way that homemaking would be practically a part of their heritage. But conditions have changed since the time of our grandmothers, when homemaking was practically all that was demanded of women. Today we ask not only that a mother shall be a good wife and mother, a good homemaker, but that she be a good church woman, a good society woman, a good club woman, a good citizen in the town in which she lives. And these many duties have filled the lives of our women until they have little time left for definite instruction to the daughters in the homes. The daughters, too, have their days filled with school duties, music and the many demands which are made upon them by their neighbor girls. All this makes it almost impossible for the mother to find time when she can have the daughter at home to give her instruction in homemaking.

There is another point in the fact that the families of today are much smaller than they were two generations ago, and the demands of each family fill the time of the members of that family so thoroughly that outside of school life the girl has little time for study or for the practice of housewifely duties.

A second way of teaching our girls homemaking comes through the public schools. We learned years ago that it was much more economical for a community to hire a teacher to teach all the children of the community arithmetic, grammar and geography, than to expect each mother to teach her own children these branches. The same economy is found in teaching homemaking. One teacher can teach 30 girls the principles of homemaking easier than can 30 mothers teach their own girls, even though the mothers knew as much about it as does the teacher. If the work of domestic science is put into the public schools, every girl has some teaching in this direction. And who will question the usefulness in this line? Which will she use most in her common life, knowledge of quadratics or knowledge of yeast? Which will be of most value to her, knowledge of ancient history or knowledge of the insect life which is common about her? Will she not give thanks in the coming years for knowledge of the fabrics of which her clothes is to be made or her house decorated, much more than for the knowledge of German or ability to translate a few Greek sentences? In no sense would I give the impression that I undervalue the studies in the schools. The more our girls can have the better. But certainly the knowledge of homemaking will give her much more power for the duties that will come into her life than will the knowedge of any other one branch. It is her right to have this knowledge, and we owe to the girls in every community the training that will make them most useful and most helpful in coming years.

A third way in which a girl may gain this knowledge of homemaking today is by special schools planned and carried on with the purpose of giving girls training in homemaking after they are through their other school life. This is the method largely used in the European countries. The criticism the Americans give this method is that so many American girls leave school early, marry young and are not likely to take the time to come to the special school. Public school life reaches so many more girls in every community that it seems to give more training than can the special school.

All this supposes that we are a unit in believing that a girl should know something of homemaking before she comes into her own home. We have a right to believe this if we look at every other kind of business carried on in our country. No man trusts a banker who has not had a banking training. Not one of us would ask to have a prescription put up at a store unless some one in that store had a druggist's training. We do not trust our lives in the hands of a doctor who has had no medical education. We do not even want to hear a man preach unless he has had theological training. Our clothes must be made by a practiced dressmaker. We send our children to schools presided over by trained teachers. Is it right, or just, or wise, or profitable to ask a girl to make a home, and to care for the physical, mental and spiritual growth of a family without giving her some help toward making that work easy for her and giving her power to make her work accomplish the best results possible?

I shall be glad to have discussion upon this point, because I am sure every woman in this house has thought over the matter for her own daughters if she has any, if not, for the daughter of her neighbors; and in a state like Illinois where domestic science has a strong hold upon nearly every county in the State, the women have certainly thought earnestly and well along this line.

FAMILY FOOD: BALANCED RATIONS FOR PEOPLE.

Mrs. Nellie Kedzie Jones—Wednesday Morning Session.

Those of you who know anything about the feeding of cattle through Illinois and through all the western country, know that when a man plans to feed his cattle he estimates what money he can make out of them, and the first thing he does is to see that he keeps his cattle healthy and well. He knows steers will not grow and bring money for him unless he gives them good food, and the more food he can get into them and have that food made into energy and strength, the more money he can make. The first thing he does after he plans to get his stock sold, is to find out the best ration he can get for that pen of hogs, calves, or whatever it may be. Now, he puts that pen full of live stock to eating this balanced ration, but that is not enough. He feeds them with balanced ration every day and then watches them carefully. He may have 100 steers in one lot. Pretty soon he finds one that is not thriving; he takes it out and gives it a different ration. He changes its food, he plans, he works, and pretty soon finds another that does not thrive, and out of his hundred he may get perhaps ten that do not thrive on the regular ration.

Now it seems to me we ought to know as much about our children and our family, and we ought to be as anxious to learn about them as the man is about his cattle and pigs, and it also seems that if we plan out a balanced ration which has been found by the scientists and investigators to be a general, good food, we ought to be willing at least to try it and to watch our family and see whether that balanced ration is going to be better for them than the food we have used. If that balanced ration is not good we ought to have brains enough to work out a good ration for ourselves.

It is not true that we are machines, it is not true that we can be made to work just exactly like well oiled cogs and well run engines, because there are individual differences in us and we have to watch ourselves for that very reason. If we had been made like the sheep, with our clothes on our backs and our food right before us, we need not have any trouble about food. But we are not.

We were give brains and we were supposed to use them. I do not know in what way brains tell better in the long run than in planning the food for the people who come within reach of the household. I do not know where food tells better than in the brain of the child. I know a mother who said. "My two younger children will never do the work that their older brothers and sisters do, because when they were little we lived way out west for years; we almost starved and those children did not have the good, wholesome food that their brothers and sisters had when they were growing."

This matter of food means a great deal to all of us. It means just as much to you and to me as it does to somebody in our power. Sometimes I think the responsibility is more for each one of us to feed ourselves than to look after other people, because other people ought to know what to eat. You have not the right, I have not the right, to ruin the machinery of our bodies attempting to make brain and body power by putting in the wrong kind of fuel. Any man who runs an engine and puts in fuel that does not give a good steady fire will get poor results. If he puts in cobs and shavings he cannot do good work. If on the other hand he puts in big chunks of coal what then can he do with his machinery?

We have no right to feed our engines, the bodies, by putting poor material in our stomachs and then expecting good work of them. This matter seems well worthy all the thought we put to it. Some people only eat two meals a day, some only one. I have known people who practically lived their lives by eating only one good meal a day. The Germans eat five times a day and we find sometimes they do better work than some of us who eat three meals, or two, or one.

When you come down to the foundation of the whole thing it simply means that good brains for your body and the people within your power is the one thing to be used. If you use your brains to the very best purpose, and find out about the facts the scientific men have put before us, you will have no trouble in planning your food.

I believe Americans, as a rule, eat too much. I believe that more Americans hurt their stomachs by overeating han by undereating. In this great land of plenty there is not much starving from lack of food, but there is a good deal of starving from overeating. Some of these days, when we know more about it, we can plan more definitely, but nowadays it means pretty careful planning to keep yourself, the children, or whoever is within your reach, in absolutely perfect health.

Now, I suppose when we remember how few things we need it ought to be an easy thing to plan them. It is not an easy thing. Our grandmothers learned certain things by experience, but we have no right to step into our homes and expect to learn everything by experience. We have the right to take all the experience before us and put it in shape so we shall be able when we take hold of the home to do the best work possible.

We have water and proteid, that is the muscle forming food, and the sugar, along with the fats. These, with the minerals, give all that is necessary in the make up of the body. We have the minerals for the bones and some other parts of the body; we get those through our great range of variety in foods.

One of the great lacks in our food is water. I suppose not half of you people sitting here drink enough water. The doctor who takes care of you when you are ill knows that you do not drink enough water as a rule. The man who feeds cattle knows that unless he gives them plenty of water they will not be able to take care of their food. It all comes back to the matter of using brains about food. For a good many years we did not think we had to use any brains in this direction, but after all I think we are coming to feel that as a people we have got to be better fed, and that means food planned with more brains. It is not right for people to neglect any part of the body, and above all, to neglect the food that keeps the body going.

We want a word from the many women present who feed people. There are a number of home makers here who have fed people for a number of years—some of you successfully, some not so successfully; some of you have failed and some of you do not know where you have failed. I hope there will be plenty of good testimony for the work you have done. When the men go to their county and State institutes and talk for half a day at a time simply about feeding calves, or feeding colts or pigs, feeding for beef or feeding for milk, it is certainly worth our while, and worth a great deal more, to talk about feeding these people of ours. It means that the food put into people ought to come before us as one of the most important subjects we have, and I shall be glad to hear from the ladies on this matter.

DISCUSSION.

I would like to ask what you would do with people when you know what is good for them and they refuse to eat it. Now in the majority of cases they do not care for vegetables, they will not touch anything but potatoes, but they want to eat meat three times a day and white bread, and it is almost impossible to get them to touch a bit of anything made of corn meal, graham flour, etc.

Are you sure you know what they should eat?

I am a farmer's wife. We have a number of men on the place all the time, and they are mostly Swedish people. They come from a cold country where they do not eat any vegetables. One man who has lived with us for four years drinks no tea or coffee, eats very little potato, but eats a little oatmeal, and if he can get his hard rye bread, such as they have in Sweden, like an immense cracker with a hole in it, he eats this and drinks a little water and thinks he is well fed indeed, but it does seem sometimes as if he needed vegetables.

Is he a strong man?

He is a strong man and is muscular. They say meat makes people cross, but he is the best natured man I ever saw.

I am not at all sure but what he knows what is best for him better than any one else does. We say sometimes that certain things are good for you. If you are a grown up man or woman, it is your business to find out whether they are good for you or not. I knew a girl from the south who went up north to school. In about six months she was ill with dyspepsia and had to be sent home. She believed it was caused by eating cold bread. She was fond of hot bread and had never eaten any cold bread. Now, that was an extreme case, but I honestly believe that such things happen, and I believe in the use of brains for yourself, and particularly for the children. In this way we are simply using the material God has put within our reach. Not three weeks ago we had word from one of the largest schools in the south. They are feeding 1,600 people in their dormitories, and the man who has charge of all these people said: "We have given up our balanced ration, we cannot do it for we cannot make those students eat. We cannot make them eat enough of the balanced ration to keep them well and healthy. We have to change the food and adapt it to their conditions and give them such food as they can eat and balance it as best we can." You cannot make machines out of us, and you cannot make a ballanced ration that will feed everybody. It is the old thing of applying brains to everything. You cannot give to a baby the same food you give to a man. It is the individual thought that is necessary.

You said that people eat too much. That is a question I have studied for many years. What is the cause of people eating too much?

I think that one of the causes is that we make things taste too good (laughter), and I think we are going to keep right on making them taste good, because we want our people to learn abstinence, temperance, and to judge for themselves. Now there is no reason in the world why you or I should go down stairs and make our dinner on mince pie because it tastes good; but, on the other hand, there is no reason why we should not make that mince pie taste good, if we make it at all. Now it is not a matter of taking a temptation away from people. You know and I know that if we bring up a boy or girl, and keep him or her entirely away from temptation, that boy or girl is of no account in the world. Teach him to meet temptation and how to withstand it. I do not believe that we ought to make things taste any less good than we can do.

I have a family— a wife and eight children, and I tried my best to get my women folks to do away with this fancy eating, but they claim they cannot do it; that it is the style; we have got to set up just as fine a table as our neighbors.

I think that the gentleman has struck the key-note of a good deal of trouble. It is true that many a woman is a slave to her neighbors' ideas, and when women learn to use their own judgment instead of following their neighbors' ideas we shall have many more families in better health. I know a mother who says, laughingly (and I don't think it a laughing matter): "My children always get sick when I have company." Simplicity in cooking will mean a great deal, not only to the family eating it, but to the woman who has to prepare the food.

I think that what you call fancy cooking is only decent cooking. By fancy cooking I do not mean stuff that is not fit to put in your stomach, but to make it delicately and serve it beautifully. A woman wants to have as good a table as her neighbors', not because she wants it herself, but for her family.

I have had a perfectly dreadful experience with little children. I feel sometimes I could go miles to help any poor mother. I was not used to children. I had never seen a child like mine; she could not eat anything. I doctored and doctored, and took her to summer resorts, and still no help; and whenever she ate anything that did not agree with her she went into convulsions, and all the doctors did for her was to give her a solution of chloral for fever. Finally I came to the conclusion that the trouble must be reached through the stomach. I tried milk, but it did not agree with the child. I finally tried oatmeal and found that it did not agree with her. Then I took the hulls out and she began to thrive. For a while she got so she could eat it with the hulls in after straining. I have a great deal of trouble with my relatives as to the way I feed my children. One day my little girl went to visit her aunty. When she returned I found she had eaten seven cookies and two doughnuts—something I never allowed. Her aunty said she thought it a splendid opportunity, as she never had anything to eat.

I think that is evidence that it needs brains to feed people, and that you can not lay down castiron rules.

I had trouble with fruit. Everybody says fruit is so healthful. It does not agree with my children. They are getting so now that they like a very little fruit, simply a slice of orange or a small piece of apple.

My son was born with a delicate stomach, and until he was 8 months old I was never able to find anything he could retain on his stomach to my satisfaction. A southern lady visited me one day, and said: "You are starving your baby to death; what do you feed your baby?" "Well," I said, "I feed him what will agree with his stomach, but I have not succeeded very well in finding out what it is." She said: "Have you tried breakfast bacon and crumbs together?" I told her I did not think that was food for a baby to eat. However, I tried bacon and crumbs, frying the bacon to a crisp, and fed a very small portion of that two or three times a day, and I found that corrected the stomach. The smoke in the bacon and the salt seemed to tone up the stomach.

I had a little boy who was just as well as a baby could be, but he was small for his age. My mother was taking care of a boy three times as big, whom she had adopted. She said to me: "If you would only feed Harry oat meal he would grow much faster. He does not have enough to eat." I strained some oat meal and gave him two teaspoonsful. In two hours my baby lay in my arms in convulsions. We called in the doctor and he gave the baby something to quiet his stomach. After six months we tried oat meal again, and taking the precaution to strain it again and again, but the child went into convulsions, so we gave that up. It was his greatest delight, from the time he was a little more than a year old, to have a piece of bacon, and he would suck that until it was a mere string. He sucked all the juice out of the bacon.

I know of a child that was given up by the doctor. This child was nothing but skin and bones. The doctor advised giving it bacon, but the mother refused to do so. I said the child would die anyway, so why not try the bacon. It was tried and the child today is strong and healthy.

I think little children are fed too much pie and cake. The gentleman said he had a large family. Perhaps his wife has a great deal to do. So many mothers think they must have pie and cake, and I think they ought to be done away with. Another thing, when we have company I think it is wrong to work until we are worn out in order to serve our company.

WHO BUILDS THE CHILD'S CHARACTER?

Mrs. Nellie Kedzie Jones—Thursday Morning Lesson.

I suppose there is no one thing that we all admire so much and look for so much in our friends and the people with whom we come in contact, as this one thing we call "character," and just what character means is a very broad thought. You remember Emerson said, "the building of character means more than the building of everything else," and so when we build character it means something in the world. I suspect the grandmothers and grandfathers who have transmitted more or less to the children do not realize that they have quite as much to do perhaps with the growth and character in the children as do the fathers and mothers who have absolute hold on the children. Of course that brings to us the two points, whether it be heredity or environment, that does most for the character of the child. I think nobody is ready to say it is one or the other, although I believe the men and women who have worked most in this line have decided that environment has more to do with building the character than heredity. None of us want to meddle with that question very much. The men and women who have had most to do in taking children from the criminal classes, those of bad blood and bad families have found they get a larger proportion of well grown men and women (I do not mean grown in body only but in character and development as well) from a good environment out of poor heredity, than they do from good heredity in poor environment, so we will have to conceive that both are necessary, both heredity and environment, to make the child's character.

Now just a little thought about what character means to us. I knew a woman who, when her little girl fell from the fence and broke her arm, took the child to a surgeon and had the arm set. The surgeon did not set the arm right and when it healed it was crooked. The mother took the child to Boston and the surgeon there said: "If your child could fall off a fence again and break her arm again in the same place we could reset it and make it straight, but it cannot be helped now." The mother called the child to her and told the child to hold still. She took the little arm across her knee, snapped the arm in two, and said to the surgeon, "Now set that arm right," then she fainted. Long afterward somebody said to her, "How could you do it?" She answered, "Do you suppose I could let my child grow up with a crooked arm when I could help it?" That woman had character, she had strong character in every direction. It is not rational to do things like this often, but I do believe that many times mothers forget even while they try to build up character in their children to be strong themselves.

I believe many times that the little things the child notices the most, are the things that count most in his own character. The mother sometimes says, "I cannot bear to refuse my child anything we have on the table even though it hurts him. I cannot bear to make him do this, or I cannot bear to do that." Don't you suppose the child looks at the mother and knows she is weak? Children learn early to judge.

A mother tells her child the "Black man" will get her if she does not do so and so, or says she will shut her up in a dark closet, when the mother knows she will do nothing of the kind. Don't you suppose the child very soon finds out the mother is not telling the truth? Don't you suppose she soon learns to say many things that are not true? In the case of the boy when he grows older and his father gives him a calf, colt or pig, then by and by when it is sold and it is father's money that came from the pig, or colt or calf, and father's money that came from the steer, don't you suppose the boy begins to learn his father is not honest and feels he can cheat some one?

Don't you suppose the boy begins to feel it is the thing to do because his father did it? The children see on the streets the men who are most respected and looked up to in a community, smoking day after day and frequenting the saloons. The fathers laugh and speak of these men as pretty smart or sharp. Don't you suppose the boys mean to question why these men are admired, and soon the boy thinks they are admired because they do these things that are questionable. He thinks it is manly to do these things. It all helps in the growth of character.

In the school, when the child finds the teacher is not quite honest in working out various problems, or perhaps he says he will find out thus and so tomorrow, and then forgets, the child does not always remember that the teacher forgets, sometimes he thinks the teacher does it on purpose, and there the teacher has lost a hold he might have used to build up an honest character.

I heard a young man say once: "I used to keep chickens when I was a boy and asked $2 a setting for our eggs, and when people came along in the spring and wanted to buy setting eggs of me I used to take a pin and break or pick the end so they would not hatch, and then they would have to come back and buy other eggs." Some children were there, and I wondered what the children thought and how much of a stone there was laid in the foundation of character these children were building.

Last fall I was on the train which stopped at a small town. A mob came up directly after it had hanged a colored man just over in the borders of Indiana. They took him from Illinois to Indiana and hanged him. They were all talking about it. They were chattering back and forth, saying, "Did you see that or did you hear that," and the mob was all composed of young men. There was not a middle aged man among them. The mob had taken the prisoner away from the sheriff just as the school children were let out. The children saw the mob take the man away. The next day I heard a traveling man who was not interested in that town say, as we were going down to the station in a 'bus, "This town is full of talk about that mob, and they talk about it just as they would of a horse race." They had not thought of the sacrifice of human life that had been taken. They had not given a thought to the idea of mob law, and as those children grow up and become men and women they will have less respect for human life because they heard the talk of that mob when they were children.

Now, it seems to me this should show us that we have a duty toward children, whether we have children in our homes or not. We are responsible for the building of the character of the children in the community. I believe every man and woman who comes in contact with children in any way (and who does not?) has an influence on the building of the character of the children in his town or community, and I do not believe any man or woman can shirk the responsibility. I do believe that the fathers and mothers carry the most perhaps. I believe, next, the teachers and preachers have the most responsibility. But no citizen can shirk his share of responsibility for child life in his community. I believe we are responsible for living a clean life before the children. No one can live a partially clean life and one that is partially unclean. Children are very shrewd to find out little things. I believe, when the day of reckoning comes, the sins of some of the children that have grown up in some of the communities will be laid upon the shoulders of the men and women who never thought they were responsible.

Mr. Ware, Illinois Food Commissioner—I am here as one of the represetatives of the Illinois Food Commission and we are very glad to have the opportunity of presenting the work that we are trying to do to the practical women of the State. We need your coöperation; it is impossible to enforce any law in advance of public sentiment. The law is a new one which touches every food commodity that is sold in the State, and of course touching so many interests and so much capital there are a great many things we have to contend with. The law itself is a crude one and the penalties, etc., are not always practical, but we do want the wives and mothers to understand the work that we are trying to do and we need their coöperation. Our work does not have to do with pure food but simple food. On our markets can be sold almost every kind of food unless it is injurious. If we find on analysis any class of food that is injurious then there is a penalty for selling it. There are a great many combinations of food, cheap food and some food that is regarded by some as injurious that can be sold, but it must be plainly labeled showing what it it is. The parties that are making and putting on the market alum baking powder, sometimes dodge their responsibility and use a technical or Latin name for alum. Our work is to inspect all the grocery stores and other places where food products are being sold, and of course they cannot keep these things out of our sight. We have authority to go through a grocery store and inspect everything on sale. There is a label law to compel the manufacturer to put his name and place of business on the label and it is a violation of the law not to do that, so we can always find out who is responsible for these products. While a great many of these goods are manufactured in other states where the food laws differ from our own and some have no food laws to amount to anything, we find they dump a great deal of impure food onto our markets. We find it very hard to take care of these cases and always advise the retail dealer to deal with a reputable manufacturer and one whose guarantee is some value.

I have been in the southern part of the State, adjacent to Terre Haute, Louisville and St. Louis, and there are a great many food products there that do not come up to the requirements of the law. There are a great many places we cannot get to at all, but we do find these products on the market, and we prosecute the dealer. Commissioner Jones is at Springfield now, and he has been making provision for our food laws, so they are more practical and more easily enforced than they have been.

We have jurisdiction over the ice and milk supply, and somebody here spoke of their experience in feeding babies milk. It is impossible to get pure milk in large towns. In hot weather they put in some chemicals to keep it from souring, and the very thing that prevents milk from souring prevents it from being digestible. A grown person using it in a moderate way does not feel any inconvenience, but many children who are being raised on cow's milk suffer from the effects. I remember, in inspecting one of the dairies in this State, there were 160 cows in a row, packed just as close together as sardines in a box. They did not have any food except still stock. Still stock is not a bad food, but in this case it was an old abandoned distillery, and some shyster got in there, took out a lot of that old, superannuated stock and sold it to this dairy. In that lot of 160 cows I think I am very safe in saying that there were not less than 10 per cent in the very last stages of tuberculosis, and all of them were skeletons. They were put in there and kept giving milk until they died, never going out in the sunshine at all. They were simply dripping with filth—not a spot on them as big as my hat that was not dripping with liquid filth. I went to see the mayor, and told him the conditions under which I found this stable; and I said to him: "If you will go down there with me and see those conditions, I will give you a $10 bill if you will drink a glass of that milk in my presence. You cannot do it. While you can go outside of the city and get your food, remember there are not less than 500 babies in this city, and it is murder in the first degree in allowing the sale of such milk. These people will either have to keep those in better condition or else we will prosecute them to the bitter end." The people are getting more benefit from our food laws than we have any means of knowing. They are laboring to get a national food law, and I hope it will pass, because we can enforce the law more readily. The people are not disposed to defy or disregard a national law, and I think it would be very much more easily enforced, because impure food products will not come in from other states, and the food commissioners are very glad to have the matter brought before the ladies of the State.

MINUTES OF MEETINGS OF THE BOARD OF DIRECTORS AND EXECUTIVE COMMITTEE OF THE ILLINOIS FARMERS' INSTITUTE FROM FEB. 25, 1902, TO MARCH 3, 1903.

INSTITUTE ROOM STATE HOUSE, Feb. 25, 1902.

The directors of the Illinois Farmers' Institute whose term has not expired and those elected directors at the annual convention of delegates at Rockford, Feb. 19, 1902, met as required by the statutes to organize the new board. Roll call showed the following gentlemen present: Allen, Burroughs, Chester, Clark, Coolidge, Cobb, Davenport, Easterly, Frake, Goodnow, Grimes, Grout, Hughes, King, Manley, Mann, Mason, Mills, Moore, Pierce, Rehm, Reynolds, Rossiter, Sweet, Wyman. The meeting was called to order by ex-President Kimzey. On motion of Director Hughes, the chair appointed Messrs. Burroughs, Grout and Mann as a committee on credentials. The committe, on credentials made the following report:

GENTLEMEN—We your committee on credentials beg leave to report that we have examined the reports of the delegates representing the several odd numbered districts, and find that the duly appointed delegates to the delegate convention of the Illinois Farmers' Institute held at Rockford, Ill., Feb. 18, 19, 20, and 21, 1902, have elected the following named persons to act as directors for their respective districts for the term of two years:

First District—C. P. Reynolds, 4220 Calumet Ave., Chicago.
Third District—Merrill K. Sweet, Glenwood, Ill.
Seventh District—James Frake, 625 Fulton St., Chicago.
Ninth District—Jacob R. Rehm, 589 Dearborn Ave., Chicago.
Eleventh District J. P. Mason, Elgin, Illl.
Thirteenth District—Amos F. Moore, Polo, Ill.
Fifteenth District—J. H. Coolidge, Galesburg, Ill.
Seventeenth District—S. Noble King, Bloomington, Ill.
Nineteenth District—E. E. Chester, Champaign, Ill.
Twenty-first District—Edward Grimes, Raymond, Ill.
Twenty-third District—Fred C. Goodnow, Salem, Ill.
Twenty-fifth District—H. G. Easterly, Carbondale, Ill.

In the same manner we find that the following named persons have been duly elected to fill the unexpired term of one year for the even numbered districts.

Second District—B. R. Pierce, 562 Forty-fifth St., Chicago.
Fourth District—W. Malcom Manley, 730 Forty-fourth St., Chicago.
Sixth District—F. C. Rossiter, 104 Van Buren St., Chicago.
Eighth District—John M. Clark, 71 West Monroe St., Chicago.
Tenth District—H. D. Hughes, Antioch, Ill.
Twelfth District—B. F. Wyman, Sycamore, Ill.

Fourteenth District—E. N. Cobb, Monmouth, Ill.
Twenty-fourth District—Israel Mills, Clay City.

Respectfully sumitted,
E. W. BURROUGHS, *Chairman.*

Director Hughes moved that the report of the committee be accepted, and that the board proceed to elect officers, without nominating speeches, and that the first ballot be an informal one.

Motion adopted.

The chair appointed Directors Wyman, Easterly and Mann as tellers.

An informal ballot was then taken for president, as follows: Coolidge 15 votes, King 5 votes, Grout 1 vote, Frake 1 vote, Mann 1 vote, Steenberg 1 vote, Easterly 1 vote; total, 25 votes.

The formal vote for president resulted as follows: Coolidge 18 votes, King 5 votes, Grout 1 vote, Easterly 1 vote; total, 25 votes. Mr. J. H. Coolidge having received a majority of all the votes cast was declared duly elected president for the ensuing year.

The chair appointed Mr. E. E. Chester a committee of one to escort President-elect Coolidge to the chair.

After thanking the board for the honor conferred upon him, President Coolidge announced that an informal ballot for vice president would now be taken.

The informal ballot for vice president resulted as follows: King 4 votes, Grimes 2 votes, Easterly 12 votes, Allen 2 votes, Chester 4 votes, blank 1 vote; total, 25 votes.

The formal vote for vice president resulted as follows: King 2 votes, Easterly 15 votes, Allen 2 votes, Chester 3 votes, blank 1 vote, Hughes 2 votes; total, 25 votes. H. G. Easterly having received a majority of the votes cast was declared duly elected vice president.

The informal ballot for secretary resulted as follows: A. J. Mills 1 vote, A. B. Hostetter 13 votes, A. J. Bill 8 votes, F. C. Goodnow 1 vote, King 1 vote, blank 1 vote; total, 25 votes.

The formal ballot for secretary resulted as follows: Hostetter 12 votes, Bill 13 votes; total, 25 votes. Mr. A. J. Bill having received a majority of the votes cast was declared duly elected secretary.

The informal ballot for treasurer resulted as follows: F. C. Rossiter 1 vote, Grout 16 votes, King 5 votes, Hughes 1 vote, Hostetter 1 vote, Grimes 1 vote; total, 25 votes.

The formal ballot for treasurer resulted as follows: Grout 17 votes, King 5 votes, Hughes 1 vote, Grimes 1 vote; total, 25 votes. Mr. A. P. Grout having received a majority of the votes cast was declared duly elected treasurer.

The informal ballot for superintendent resulted as follows: Bill 16 votes, Hostetter 8 votes, Cobb 1 votes; total, 25 votes.

The formal ballot for superintendent resulted as follows: Bill 13 votes, Hostetter 12 votes; total, 25 votes. Mr. A. J. Bill having received a majority of the votes cast was declared duly elected superintendent.

The secretary-elect not being present, Director A. P. Grout moved that Mr. Hostetter be appointed secretary till the new secretary could be installed in his office.

Motion adopted.

Mr. F. I. Fowler of Chicago was introduced by the chairman and talked at some length about a national Chautauqua movement, to be carried on in Northern Illinois, and asked the coöperation of the Illinois Farmers' Institute in promoting the same.

Director Burroughs moved that the chair appoint a committee of five to confer with Mr. Fowler on the idea of a Chautauqua movement, to be participated in by the Illinois Farmers' Institute.

Motion adopted.

The president appointed Directors Frake, Hughes, Rehm, Reynolds and Sweet as such committee.

President Coolidge announced that he would appoint Directors Frake, Easterly, Mann and Wyman to act with himself as executive committee.

On motion the board adjourned till 10:30 a. m. Wednesday, Feb. 26, 1902.

INSTITUTE ROOM, Feb. 26, 1902, 10:30 a. m.

The board of directors met as per adjournment. Present on roll call: Allen, Coolidge, Cobb, Davenport, Easterly, Frake, Goodnow, Grimes, Grout, Hughes, Manley, Mann, Mills, Moore, Reynolds, Rossiter, Sweet and Wymann—total 18.

Director Goodnow moved that each director be requested to furnish two lists—one to contain the names of the speakers he recommends from his district, and a list of those he does not consider worthy to be on the list of speakers.

Director Grimes moved as a substitute to Mr. Goodnow's motion, that the present list of speakers be sent to each director and that he return it to the secretary, marking those he considers worthy and adding the names of those whom he desires to recommend as worthy to be on the list of speakers.

The substitute was adopted.

Director Davenport moved that all the speakers on the recommended list be expected to receive compensation for their services, except those from the university.

After considerable discussion the motion by general consent was withdrawn.

Director Frake moved that no county farmers' institute be permitted to ask for more than one speaker for an institute from the University of Illinois.

Motion adopted.

Director Allen offered the following resolution and moved its adoption:

WHEREAS, The counties remote from the place of holding the annual institute are only partially represented and in many cases have no delegates present, therefore be it

Resolved, That the committee on legislation be and are hereby instructed to prepare and introduce a bill into the next General Assembly providing for the election of directors at the time and place in each district of the congressional institute meeting.

Motion to adopt was lost.

On motion of Director Hughes the board adjourned.

Minutes read and approved April 3, 1902.

J. H. COOLIDGE,
President.

A. B. HOSTETTER,
Secretary.

INSTITUTE ROOM, Feb. 26, 1992.

The executive committee met at the above time and place on call of Chairman Coolidge. Roll call showed present, Directors Coolidge, Frake, Mann, Easterly, Wyman. The following report was made on the bills presented for auditing.

To the Board of Directors of the Illinois Farmers' Institute:

We, the undersigned members of the executive committee, having duly examined the claims of the parties named below, have approved the same and recommend that warrants in payment of said vouchers be drawn to the order of the respective claimants for the following amounts:

Warrant No....	To Whom Payable.	Amount.
2139	B. F. Wyman, expenses as director	$16 80
2140	Ralph Allen, expenses as director	36 23
2141	A. P. Grout, expenses as director	24 90
2142	..do	8 50
2143	A. F. Moore, expenses as directer	7 27
2144	C. P. Reynolds, expenses as director	9 90
2145	Ralph Allen, expenses as director	11 80
2146	W. M. Manley, expenses as director	13 70
2147	F. C. Rossiter, expenses as directer	6 95
2148	F. C. Goodnow, expenses as director	11 50
2149	Israel Mills, expenses as director	11 48
2150	E. N. Cobb, expenses as director	15 28
2151	E. E. Chester, expenses as director	8 45
2152	Merrill K. Sweet, expenses as director	14 13
	Total	$195 95

Approved Feb. 26, 1902.

J. H. COOLIDGE,
H. G. EASTERLY.

There being no other business the committee adjourned.

Minutes read and approved April 3, 1902.

J. H. COOLIDGE,
President.

A. B. HOSTETTER,
Secretary

INSTITUTE ROOM, March 20, 1902.

The executive committee of the Illinois Farmers' Institute met as per call of Chairman Coolidge. Present on roll call, Directors Coolidge, Easterly, Frake, Mann and Wyman. Minutes of the committee of Feb. 26, 1902, were read and approved.

The secretary presented letters and statements from Mr. S. A. Marrian of McDonough & Co., and J. B. Hanlon of Henry county, that the warrants issued to them for county institute expenses had been lost. The evidence of the loss of the warrants being satisfactory, Director Frake moved that the secretary be instructed to draw a duplicate of warrant No. 1832 payable to S. A. Marrian for $18.25 and a duplicate of warrant 1984 payable to J. B. Hanlon for $75.

Motion adopted.

The bill of Hughes Brothers of Clinton, Ill., for printing under the adminstration of F. M. Palmer, then president of the Illinois Farmers' Institute, was on motion referred to the full board.

Director Mann moved that the secretary be instructed to ask Mr. Fred H. Rankin to file his bill for expenses in attending the round-up institute at Rockford.

Motion adopted.

Director Easterly moved that a sub-committee be appointed to report on the condition of the institute work and the secretary's office.

Motion adopted.

The chairman appointed Directors Easterly, Mann and Wyman as such commmittee.

Director Mann moved that President Coolidge and Director Frake be a special committee to pass upon the matter for the annual report.

Motion adopted.

Director Mann moved that the reports of county farmers' institute be published in Vol. VII of the annual report be abreviated by omitting the programs of same.

Motion adopted.

Director Frake moved that the secretary be instructed to have made and published in the annual report Vol. VII cuts illustrating reports, and agricultural conditions and methods, when the same can be secured and that cuts of institute officers be omitted from Vol. III.

Motion adopted.

Director Mann moved that the bid of H. A. McKeen of $35 for packing and preparing for shipment 10,000 copies of Vol. VII annual reports be accepted.

Motion adopted

Director Easterly moved that the secretary be instructed to add the amount of the expenses of the speakers of the Domestic Science Association at the annual meeting at Rockford, to the amount of $139.29, to the general fund No. 4, and deduct the same amount from the domestic science fund No. 7, itemizes as follows:

Warrant number.	To whom drawn.	Amount.
2067	Mrs. Virginia C. Meredith, expenses at Rockford	$53 35
2068	Mrs. Joseph Carter, for Mrs. Rorer, expenses at Rockford	6 90
2079	Mrs. Joseph Carter, expenses at Rockford	18 33
2080	Mrs. S. Noble King, expenses at Rockford	17 08
2111	Mrs. E. Davenport, expenses at Rockford	22 23
2135	Mrs. H. M. Dunlap, expenses at Rockford	21 36
	Total	$139 29

Motion adopted.

Director Frake moved the adoption of the following resolution:

Resolved, That the executive committee recommend to the board of directors of the Illinois Farmers' Institute that the importance of instruction on agricultural lines in the rural schools be made a special feature of the institute work for the ensuing year, and that the best speakers available be induced to present this subject at county farmers' institutes, and that county farmers' institute officers be urged to place such subject and speakers upon their institute programs.

Resolution adopted.

SPRINGFIELD, March 20. 1902.

To the Executive Committee of the Illinois Farmers' Institute:

We, your committee to whom was referred the matter of ascertaining the condition of the work of the institute as compared with a year ago, beg leave to report:

We find there was held in the State during the past year 111 county and congressional institutes, being a gain of four over the previous year. The average attendance has been from 306 in 1900 to 375 in 1901, making a total gain in attendance in the State of 6,900 people. We find that a higher grade of talent has been employed in the selection of speakers and the questions discussed of much more practical utility.

The institutes from all parts of the State report greatly increased interest in the work. The libraries sent out by the State institute are attracting much attention, and the demand for them is constantly increasing.

The scholarships in the University of Illinois College of Agriculture granted to the Illinois Farmers' Institute seem destined to help make a wonderful revolution in agricultural methods, and are eagerly sought for by young men from all parts of the State.

Secretary A. B. Hostetter is mainly responsible for the advance that has been made. We find his office affairs kept in the most systematic and orderly manner, and we believe the prosperous condition of the institutes of Illinois is largely due to his energetic efforts in their behalf.

[Signed]

H. G. EASTERLY,
B. F. WYMAN,
F. I. MANN,
Committee.

On motion of Director Frake the report of the committee was approved.

On motion of Director Easterly the following bond of Treasurer A. P. Grout was approved and accepted:

Know All Men by These Presents: That we, Albert P. Grout, as principal, and C. H. Condit, William Neat and Percie C. Grout, as sureties, all of the county of Scott and State of Illinois, are held and firmly bound unto the Illinois Farmers' Institute, a public corporation of this State, in the penal sum of twenty thousand dollars ($20,000), lawful money of the United States, to be paid to the said Illinois Farmers' Institute, for the payment of which, well and truly to be made, we bind ourselves, our heirs, executors and administrators, severally and firmly, by these presents.

Signed with our hands and sealed with our seals this 10th day of March, A. D. 1902.

The condition of the foregoing obligation is such that, whereas the above bounded Albert P. Grout was, on the 25th day of February, A. D. 1902, duly elected treasurer of said Illinois Farmers' Institute for the period of one year, expiring February 25, A. D. 1903, and required to give bond in the penal sum of $20,000.

Now, therefore, the condition of this obligation is such that if the said Albert P. Grout shall faithfully perform and discharge the duties of his office as treasurer of the said Illinois Farmers' Institute, and safely keep all money and other property entrusted to his care as treasurer, paying the same out when ordered by the board of directors of the Illinois Farmers' Institute, and perform all duties required of him as such treasurer by the board of directors of the said Illinois Farmers' Institute, and at the expiration of his term of office as such treasurer pay over to his successor in office, when appointed and qualified, or to such other person or persons as the board of directors of said Illinois Farmers' Institute may direct or require, all moneys and other property then remaining in his hands as such treasurer, then this obligation to be void, otherwise to remain in full force and virtue.

ALBERT P. GROUT, [SEAL]
C. G. CONDIT, [SEAL]
WILLIAM NEAT, [SEAL]
PERCIE C. GROUT. [SEAL]

STATE OF ILLINOIS, } ss.
SCOTT COUNTY. }

Before me, Alonzo Elllis, a notary public in and for said county this day appeared Albert P. Grout, William Neat, Charles H. Condit and Percie C. Grout to me personally known to be the persons whose names are signed to the foregoing instrument in writing, and acknowledged that they executed the same for the uses and purposes therein stated.

Given under my hand and seal this 10th day of March A. D., 1902.

(Signed)

ALONZO ELLIS,
Notary Public.

Director Wyman moved that the secretary be instructed to correspond with the officers of the Illinois Association of Domestic Science in regard to having them use the complete annual institute report instead of issuing a special pamphlet reporting simply domestic science proceedings.

Motion adopted.

After duly examining the reports of county farmers' institutes and other bills presented for payment the following report was made in regard to the same:

To the Board of Directors of the Illinois Farmers' Institute:

We, the undersigned members of the executive committee, having duly examined the claims of the parties named below, have approved the same and recommend that warrants in payment of said vouchers be drawn to the order of the respective claimants for the following amounts:

Warrant No....	To Whom Payable.	Amount.
2153	Champaign County Farmers' Institute, Z. R. Genung, treasurer	$75 00
2154	13th District Farmers' Institute, Z. R. Genung, treasurer	50 00
2155	Cass County Farmers' Institute, J. G. Pratt, treasurer	75 00
2156	Carroll County Farmers' Institute, John Simpson, treasurer	75 00
2157	DuPage County Farmers' Institute, J. W. McKee, treasurer	75 00
2158	Bureau County Farmers' Institute, G. C. Kellogg, treasurer	75 00
2159	11th District Farmers' Institute, G. C. Kellogg, treasurer	50 00
2160	Warren County Farmers' Institute, T. S. McClanahan, treasurer	75 00
2161	Adams County Farmers' Institute, E. S. Frank, treasurer	41 24
2162	Mercer County Farmers' Institute, Paul Ketzel, treasurer	75 00
2163	Will County Farmers' Institute, E. L. Wilson, treasurer	75 00
2164	Coe Bros., stamp pads	1 00
2165	Adams Express Co., expressage	2 54
2166	Pacific Express Co., expressage	3 08
2167	American Express Co., expressage	3 16
2168	Western Union Telegraph Co., messages	49
2169	Phillips Bros., printing cuts in annual report	50 20
2170	A. B. Hostetter, postage, etc., secretary's office	3 50
2171	A. B. Hostetter, salary for February, 1902	125 00
2172	O. T. Bright, expenses speaker at Rockford	23 00
2173	Joseph Newman, expenses as director	7 00
2174	W. R. Goodwin, expenses as director	7 00
2175	J. M. Clark, expenses as director	19 75
2176	J. P. Mason, expenses as director	19 96
2177	Mrs. J. C. Blair, expenses speaker Ill. A. D. S	23 16
2178	Mrs. S. Noble King, expenses speaker Ill. A. D. S	15 70
2179	A. B. Hostetter, for assistant in library work	50 00
2180	A. D. Shamel, expenses as speaker at Rockford	29 29
2181	Pantagraph Co., 750 papers	22 50
2182	F. I. Mann, expenses as director	8 75
2183	B. F. Wyman, expenses as director	16 55
2184	James Frake, expenses as director	6 00
2185	H. G. Easterly, expenses as director	13 00
2185	J. H. Coolidge	21 10
	Total	$1,202 92

(Signed)

J. H. COOLIDGE,
JAMES FRAKE,
H. G. EASTERLY,
F. I. MANN,
B. F. WYMAN.

Director Frake moved that the president of the board be directed to call the board of directors to meet on April 3, 1902, said meeting to take the place of the May meeting, and that all committees be requested and expected to transact their business at that time.

Motion adopted.

On motion of Director Mann the committee adjourned.

Minutes read and approved April 3, 1902.

J. H. COOLIDGE,
President.

A. B. HOSTETTER,
Secretary.

SPRINGFIELD, ILL., April 3, 1902.

The board of directors met as per call of the president in the Institute room, State House, on April 3rd, at 10:30 a. m.

Roll call showed the following directors present: Allen, Burroughs, Chester, Coolidge, Cobb, Davenport, Easterly, Frake, Goodnow, Grimes, Grout, Hughes, King, Manley, Mann, Mason, Mills, Moore, Newman, Reynolds, Rossiter, Sweet, Wyman.

The minutes of the board meeting of February 25th and 26th and of the executive committee meetings of February 26th and March 20th were read and approved.

Director Grout called up the bill of Calhoun County Farmers' Institute for the expenses of their meeting at Hardin on the 12th and 13th of November, 1901, and called attention to the charges for printing announcement and proceedings.

Director Wyman moved that the bill of Calhoun County Farmers' Institute for expenses be allowed.

Director Chester moved to amend by striking out the items for printing announcement and proceedings. Amendment adopted.

Motion as amended adopted.

Director King, chairman of the committee on State meeting, reported that delegates were present from Bloomington to invite the board of directors to hold the next annual State institute in the city of Bloomington.

Director Frake moved that the delegates from cities asking for the State Institute meeting be held at 1:30 o'clock p. m., and that ten minutes be allowed for each city to present its claims.

Motion adopted.

The committee on agricultural education and library reported as follows:

SPRINGFIELD, ILL., April 3, 1902.

To the Board of Directors State Farmers' Institute:

GENTLEMEN—Your library committee respectfully submits the following report:

I.

From the appropriation of $2,500.00 available July 1, 1901, there have been equipped seventy-one (71) libraries, with a total of 3,100 volumes.

One hundred and twenty (120) agricultural bulletins have been added to the libraries previously equipped.

Director Davenport made a report for the special committee appointed to report plans for the enlargement of the institute work.

Director Mann moved that the board go into executive session to consider the report of said committee.

Motion to go into executive session adopted. The board then went into executive session.

The board being again called to order in regular executive session, Director Mann, chairman of the executive session, reported the following resolution, adopted in executive session:

Resolved, That the report of the special committee of the Illinois Farmers' Institute, together with the by-laws of the organization, be referred to a committee of five, of which the president shall be a member, to draft and report a revised set of by-laws in accord with the general spirit of the report of the special committee.

The president appointed the following members to act with him on such committee: Directors Burroughs, Grimes, Frake and Reynolds.

Director Chester reported that he had heard from Decatur, and that all requirements would be met—hotel rates, railroad rates and ample accommodations for all purposes.

Director Drake moved that the board proceed to select a location for the State meeting by ballot.

Motion adopted.

The president appointed Directors Allen and Reynolds as tellers.

The first ballot resulted in the following vote: Bloomington, 17 votes; Decatur, 4 votes; Carbondale, 1 vote.

Bloomington having received a majority of all the votes cast was declared the choice for the location for the next annual State Institute.

On motion of Director Goodnow the board took a recess till 8 o'clock p. m.

INSTITUTE ROOM, April 3, 1903, 8 p. m.

The board again convened as per adjournment; present, same members as at previous sessions.

Director Burroughs, chairman of the committee to revise the bylaws, reported as follows:

To the Board of Directors of the Illinois Farmers' Institute:

We, your committee to revise the by-laws, beg to report the following:

That section 12 of the present by-laws be made to read as follows: The office of secretary and State superintendent of institutes shall be filled by one and the same person. The salary of said office shall be the sum of two thousand five hundred dollars ($2,500.00) per year, payable monthly; said salary to cover all clerical expenses, including stenographer.

Your committee recommend the following additional by-law:

An auditor, who shall be a member of the board of directors, shall be appointed by the president; and that bills for expenditures of the board be paid upon the approval of the auditor, through warrants properly signed by the president and countersigned by the secretary, but that no bills shall be audited or paid except from funds appropriated for the purpose.

One hundred and ten (110) volumes relating to domestic science have been purchased for the use of the Illinois Association of Domestic Science, in pursuance of the order of the board.

The sum of one hundred fifty-two ($152) dollars has been expended for clerical help in connection with library work.

There is a balance on hand to the credit of the library fund of fifty-four ($54) dollars.

II.

There are now in use one hundred eleven (111) libraries and two cases of domestic science books which are in charge of Mrs. S. Noble King of Bloomington, Ill.

Fifty-seven (57) libraries have been returned and reshipped making a total of 128 libraries sent out the past eight months, an average of 16 per month.

The reports from the 57 libraries returned show that 4,094 books were loaned, an average of 73 loans from each library.

There are 17 applications for libraries now on file with the secretary.

The best results seem to have been reached in localities where the secretary has been able to get the coöperation of an active teacher as local librarian.

There has been an evident increase of use of books relating to agriculture.

III.

A list of all books now in use, arranged alphabetically by authors and titles, is nearly ready for the printer. The secretary has also arranged a card catalogue, and system of library records.

IV.

Your committee recommends:

1. That an additional supply of bound bulletins of the department of agriculture be procured for use with the new libraries.

2. That the sum of $152 expended for clerical help, and charged to the book fund, be restored to that fund, if there is a balance in the general fund available for that purpose.

3. That the secretary be advised to keep a record of the kind of books most read, and especially of the extent to which use is made of works on agriculture and domestic science.

4. That, if practicable, the secretary be authorized to visit teachers' institutes during the summer months, with a view to increasing the coöperation of county superintendents and teachers in the country schools.

5. Your committee commends very highly the diligence and pains-taking care of the secretary in this department of his work.

A. Bayliss, *Chairman;*
J. H. Coolidge,
E. E. Chester,
Edward Grimes,
Committee.

Director Moore moved that the report of the committee on agricultural education and library be adopted and placed on file.

Motion carried.

The secretary made the following report of the present condition of the several funds:

Springfield, Ill., April 3, 1902.

To the Board of Directors of the Illinois Farmers' Institute:

I beg leave to report for your information that the secretary's books show the following balances to the credit of the several funds on April 1, 1902:

Number.	Name.	Amount.
1	Office supplies, postage, etc	$785 56
2	Salaries and clerk hire	681 00
3	Libraries	54 00
4	General expenses	17 76
6	Districts	96 11
7	Domestic Science Association	163 96
	Contingent fund	700 00
	Total balance	$2,497 39

Under this condition of the funds it will be necessary to apportion some of the contingent fund to the general fund to meet the expenses of this meeting of the board.

Respectfully submitted,

A. B. Hostetter, *Secretary.*

Director Allen moved that the report of the secretary be referred to the auditing committee.

Motion adopted.

On motion the board adjourned to 1:30 p. m.

Institute Room, April 3, 1902, 1:30 p. m.

Board again called to order by the president; same members present as at the morning session.

The hour for hearing from cities desiring State Institue meeting having arrived, Mr. B. F. Harber, president of the Business Men's Association, spoke in behalf of the committee representing the city of Bloomington. He extended an invitation to the board of directors of the Illinois Farmers' Institute to hold the next annual meeting in the city of Bloomington. He promised the use of the Coliseum for the institute sessions and such other halls for other meetings as the committee might require, free of charge to the Farmers' Institute. He also guaranteed reduced hotel and railroad rates for those attending the State Institute.

Mr. L. H. Kerrick, Col. Hefferman and other members of the delegation spoke of the advantages afforded by Bloomington, and pledged the hearty support of all the people of Bloomington, farmers, business men and citizens of McLean county generally in making the State meeting, if held at Bloomington, the best ever held.

Director E. E. Chester asked that consideration of the location be deferred until Decatur could be heard from.

Director Frake moved that choosing a location for the State Institute be made a special order of business for 4 o'clock p. m.

Motion adopted.

That section 10 of the present by-laws be amended by striking out the words "shall audit bills for expenditures authorized by the board."

E. W. Burroughs,
Chairman of Committee.

The committee was granted further time to report additional amendments.

The roll being called on the adoption of the amendments, they were adopted by the following vote: Ayes—Allen, Burroughs, Chester, Coolidge, Cobb, Davenport, Easterly, Frake, Goodnow, Grimes, Grout, Hughes, King, Manley, Mann, Mason, Mills, Moore, Newman, Reynolds, Rossiter, Sweet, Wyman—ayes, 23; nays, none, and the amendments were declared adopted.

Director Burroughs moved that seven hundred ($700) dollars in the contingent fund be transferred to the general fund No. 4.

The roll being called on the appropriation of the $700 to the general fund the vote resulted as follows:

Ayes—Allen, Burroughs, Chester, Coolidge, Cobb, Davenport, Easterly, Frake, Goodnow, Grimes, Grout, Hughes, King, Manley, Mann, Mason, Mills, Moore, Newman, Reynolds, Rossiter, Sweet, Wyman. Nays, 0. Ayes, 23; nays, 0.

Motion adopted.

A communication from Mrs. Eva H. Springer, secretary of the Woman's State Buttermakers' Association, requesting the farmers' institute to offer $100 in premiums for butter to be exhibited by the members of said association at the State Fair in 1902.

Director Newman moved that the secretary be instructed to notify Mrs. Springer that the institute had no funds for such purpose.

Motion adopted.

Director Burroughs moved that the funds available on July 1, 1902, be apportioned as follows:

Number.	Name.	Amount.
1	Office expenses, postage, printing, etc	$1,300 00
2	Salaries, etc	1,760 00
3	Free libraries	2,500 00
4	General expenses	1,200 00
6	District institutes	800 00
7	Domestic Science Association	300 00
8	Superintendent's traveling expenses	300 00
9	Contingent	2,400 00
	Total	$10,500 00

Director King moved to amend by making the amount appropriated for domestic science, $500.

Amendment lost.

The roll call on Director Burrough's motion was as follows:

Ayes—Allen, Burroughs, Chester, Coolidge, Cobb, Davenport, Easterly, Frake, Goodnow, Grimes, Grout, Hughes, King, Manley, Mann, Mason, Mills, Moore, Newman, Reynolds, Rossiter Sweet, Wyman. Nays, 0.

Motion adopted. Ayes, 23; nays, 0.

The secretary presented the following blank form for report of the director of the county farmers' institute which on motion of Director Cobb was adopted.

Director's report of .... Co. Farmers' Institute held at .... on ...... average daily attendance .....

Subjects discussed of practical value ....

Names of speakers who did good work and subjects treated of ....

Names of speakers who did poor work and why ....

Special features worthy of mention in program or management ....

What evidence, if any, do you find that the lessons of previous institutes have been put into practice in the above county ....

Please fill out the above report immediately after the meeting and return to the secretary of the Illinois Farmers' Institute, Springfield, Ill.

(Signed) Director .... District.

Director Wyman moved that the board proceed to elect secretary-superintendent.

Motion adopted.

Director Burroughs moved that the first ballot be an informal one.

Motion adopted.

The president appointed Directors Allen and Goodnow tellers.

The informal ballot resulted as follows:

Hostetter, 10 votes; Hall, 10 votes; Goodnow, 1 vote; Hunt, 1 vote; Blank, 1 vote. Total, 23 votes.

Formal ballot:

Hall, 11 votes; Hostetter, 11 votes; Blank, 1 vote. No election.

Second ballot:

Hostetter, 12 votes; Hall, 10 votes; Blank, 1 vote. Total 23 votes.

Hostetter having received a majority of all the votes cast was declared by the president to be duly elected secretary-superintendent for the ensuing year.

On motion the board adjourned.

Minutes read and approved Nov. 12, 1902.

J. H. COOLIDGE,
President.

A. B. HOSTETTER,
Secretary.

INSTITUTE ROOM, April 3, 1902.

The executive committee met on the call of the chairman. Present: Directors Coolidge, Easterly, Frake, Mann and Wyman.

All bills were taken up, audited and reported as follows:

To the Board of Directors of the Illinois Farmers' Institute:

We, the undersigned members of the executive board, having duly examined the claims of the parties named below, have approved the same and recommend that warrants in payment of said claims be drawn to the order of the respective claimants for the following amounts:

Warrant number.	To whom drawn.	Amount.
2187	H. D. Hughes, expenses as director	$ 28 68
2188	Euclid N. Cobb, expenses as director	13 28
2189	F. I. Mann, expenses as director	9 72
2190	Ralph Allen, expenses as director	10 50
2191	C. P. Reynolds, expensos as director	21 81
2192	Joseph Newman, expenses as director	18 20
2193	Israel Mills, expenses as director	10.25
2194	Edw. Grimes, expenses as director	14 36
2195	E. W. Burroughs, expenses as director	10 70
2196	F. C. Rossiter, expenses as director	6 20
2197	F. C. Goodnow, expenses as director	12 00
2198	J. H. Coolidge, expenses as director	37 60
2199	James Frake, expenses as director	5 86
2200	E. E. Chester	8 79
2201	A. F. Moore, expenses as director	14 79
2202	E. Davenport, expenses as director	19 07
2203	M. K. Sweet, expenses as director	15 13
2204	W. M. Manley, expenses as director	14 65
2205	B. F. Wyman, expenses as director	17 06
2206	J. P. Mason, expenses as director	18 20
2207	S. E. Simmons, expenses as delegate to 21st District Conference	3 75
2208	A. B. Hostetter, salary for March, 1902	125 00
2209	A. B. Hostetter, postage for secretary's office	2 00
2210	American Express Co	15 18
2211	Pacific Express Co	15 14
2212	Adams Express Co	6 25
2213	John Underfanger, drayage and freight	25
2214	Edw. F. Hartman, printing and postage	50 00
2215	H. A. McReene, shipping annual reports	35 00
2216	Western Union Telegraph Co	25
2217	Springfield Trunk Co., ½ doz. locks	60
2218	A. B. Hostetter, help in library work	50 00
2219	Calhoun Co. Farmers' Institute, G. L. Aderton, treasurer	31 35
2220	Shelbp Co, Farmers' Institute, W. Middlesworth, treasurer	36 43
	Total	$677 57

Approved April 3, 1902.

Minutes read and approved Nov. 12, 1902.

J. H. COOLIDGE,
President.

A. B. HOSTETTER,
Secretary.

INSTITUTE ROOM, May, 7, 1:30 O'clock p. m.

The executive committee met as per call of the chairman. Present: Directors Frake, Easterly, Mann, Wyman and Coolidge.

Mr. W. B. Otwell of Carlinville, representing the agricultural exhibit at the St. Louis World's Fair from Illinois, addressed the committee and invited the coöperation of the Illinois Farmers' Institute in securing exhibits by the offering of prizes for samples of grain for exhibition at St. Louis.

Director Frake moved that the president of the board and the secretary be delegated to attend the meeting of the American Association of Farmers' Institute Workers, to be held in Washington the present summer, and be authorized to represent the Illinois Farmers' Institute at said meeting.

The roll being called, the motion was adopted by the following vote: Ayes—Wyman, Frake, Easterly, Mann, Coolidge; nays, none.

Director Easterly moved that the secretary correspond with parties for institute work, either as special speakers or for continuous work of two to four months.

Motion adopted.

Director Mann moved that a warrant be issued to the order of Fred H. Rankin for his expenses attending the meeting at Rockford, for the amount of $35.16.

Motion adopted.

Director Wyman moved that the balance of $95.11 of fund No. 6, district institutes, be transferred to fund No. 4, general expenses, and that three hundred dollars ($300.00) be transferred from fund No. 1, office supplies, postage, etc., to fund No. 4, general expenses.

Motion adopted.

Director Easterly moved that the secretary be instructed to have printed folders for the several directors, giving county institute secretaries. members of the board of directors and committees, etc.

Motion adopted.

Director Frake moved that the following open letter to President A. S. Draper be adopted, and the secretary be instructed to send President Draper a copy and also furnish it to the press:

SPRINGFIELD, ILL., May 7, 1902.

Dr. A. S. Draper, President of the University of Illinois:

We have noted with extreme surprise and regret certain statements in the public press of recent date, accredited to the secretary of the Illinois Farmers' Institute, to the effect that the university and its employés are not making proper use of certain funds. Seeming, as they do, to be semi-official statements, which, if true, would be of the most serious character, and fearing that their public circulation might do harm to the university and the friendly relations that have always existed between it and the Institute, this committee has met especially to discuss what can be done to satisfy the university of the position of the Institute touching such matters and to counteract as much as possible whatever damage may have been done.

After much reflection it seems to us that the best we can do is to address this open letter to you as representing the university and to secure its publication in the press of the State.

The general tenor of these statements to which we refer is to the effect that certain expense bills were unduly large and also that the university has not properly handled certain funds in whose expenditure the institute is officially concerned.

It is the purpose of this communication to assure you that these statements or others of like import are not only untrue but that they were made with out the knowledge and authority of the institute and do not express either the official sentiment of the institute or the feeling of its members. The relasions between the institute and the university have always, we believe and trust, been entirely friendly and mutually helpful, and we are anxious that they should so continue. It is our institute and our university.

The institute has no gievance against the university and if it felt one it would be quick to lay it officially before you in a proper manner in official channels, when we are positive it would receive just and proper action.

There will be no meeting of the full board of directors for many months, but we do not hesitate to speak for the institute, knowing that this letter fully represents the sentiment of the board.

Trusting that this may be received in the spirit in which it is intended and expressing regrets at so unfortunate an occurrence coupled with congratulations at the promise of your early recovery to perfect health, we are

Very respectfully,

J. H. Coolidge,
James Frake,
P. I. Mann,
H. G. Easterly,
B. F. Wyman,
Executive Committee.

The secretary reported that warrants were issued as per the following recommendation of the auditor:

To the Board of Directors of the Illinois Farmers' Institute:

Gentlemen—As your auditor I beg to report that I have duly examined the claims of the parties named below, have approved the same and recommend that warrants be drawn to the order of the respective claimants for the following amounts:

Warrant number.	To whom drawn.	Amount.
2221	Coe Bros., 1 doz. filing cases, 1 Bates No. — machine	$ 14 50
2222	American Express Co	88 26
2223	United States Express Co	53 22
2224	Adams Express Co	40 80
2225	John Underfanger, drayage and freight	3 08
2226	Edw. F. Hartman Co., printing	12 00
2227	A. B. Hostetter, postage for secretary's office	8 00
2228	A. B. Hostetter, salary for April, 1902	125 00
2229	Clarence Coolidge, delegate to 12th district conference	6 00
2230	D. M. Terry, delegate to 12th district conference	3 70
2231	A. C. Gabel, delegate to 12th district conference	3 53
2232	E. Willmarth, delegate to 12th district conference	2 40
2233	B. S. Hulburt, delegate to 12th district conference	4 50
2234	B. F. Wyman, director	3 10
2235	C. L. Merriam, expenses as delegate to 14th district conference	2 88
2236	W. B. Marvel, delegate to 14th district conference	5 61
2237	G. E. Thornton, delegate to 14th district conference	3 49
2238	E. N. Cobb, expenses as director	2 50
2239	A. B. Hostetter, expenses of visit to Rock Island Co	3 47
2240	C. M. Doyle, expenses as delegate to 15th district conference	4 55
2241	L. W. Olson, delegate to 15th district conference	1 20
2242	E. L. Grosh, delegate to 15th district conference	5 59
2243	E. H. Diehl, delegate to 15th district conference	5 57
2244	John Miller, delegate to 15th district conference	1 40
2245	A. B. Hostetter, delegate to 15th district conference	6 05
2246	Ira Cottinoham, delegate to 16th district conference	1 86
2247	S. H. Johnson, delegate to 16th district conference	2 10
2248	C. C. Pervier, delegate to 16th district conference	4 91
2249	J. W. Jones, delegate to 17th district conference	2 28
2250	D. Brewer, delegate to 17th district conference	2 62
2251	John Kerward, delegate to 17th district conference	5 22

Warrant number.	To whom drawn.	Amount.
2252	P. H. Davison, delegate to 17th district conference	$2 00
2253	J. M. Hollingsworth, delegate to 23d district conference	9 48
2254	Robert Kingsbury, delegate to 23d district conference	6 82
2255	S. T. Maxey, delegate to 23d district conference	3 25
2256	Peter Beever, delegate to 23d district conference	6 29
2257	J. J. Ewald, delegate to 23d district conference	5 50
2258	J. G. Beckemeyer, delegate to 23d district conference	3 00
2259	F. C. Goodnow, expenses as director	1 00
2260	Hezekiah Bramlet, expenses as delegate to 24th district conference	6 40
2261	J. F. McCartney, delegate to 24th district conference	8 48
2262	J. W. Wies, delegate to 24th district conference	5 86
2263	A. R. McDannel, delegate to 24th district conference	6 55
2264	M. L. Tyler, delegate to 24th district conference	5 25
2265	John P. Stelle, delegate to 24th district conference	7 66
2266	A. B. Hostetter, expenses at 24th district conference	14 79
2267	Israel Mills, expenses as director	8 20
2268	W. H. Leidigh, expenses as delegate to 25th district conference	4 50
2269	C. A. Marchildon, delegate to 25th district conference	5 00
2270	G. A. Hickman, delegate to 25th district conference	5 00
2271	J. B. Bratney, delegate to 25th district conference	5 34
2272	L. J. Hess, delegate to 25th district conference	3 50
2272	T. M. Mitchell, delegate to 25th district conference	2 00
2274	John B. Pier, delegate to 25th district conference	2 06
2275	James England, delegate to 25th district conference	50
2276	H. G. Easterly, expenses as director	31 57
2277	A. B. Hostetter, expenses attending library association meeting	12 41
	Total	$601 39

S. NOBLE KING,
Auditor.

On motion the committee adjourned.

Minutes read and approved Nov. 12, 1902.

J. H. COOLIDGE,
President.

A. B. HOSTETTER,
Secretary.

INSTITUTE ROOM, Sept. 29, 1902.

Meeting called to order by President Coolidge.

The following members answered to roll call during the season: Allen, Bayliss, Burroughs, Chester, Cobb, Coolidge, Davenport, Goodnow, Grimes, King, Mann, Mills, Moore, Reynolds, Wyman, Frake and Rossiter.

On motion of Director Mann the reading of minutes of previous meetings was dispensed with and minutes were referred to the executive committee for approval.

Prof. C. G. Hopkins made report for the committee on soil investigations and experiments, going into details in regard to the work done and illustrating same with maps and charts.

INVESTIGATION OF ILLINOIS SOILS.

REPORT OF PROGRESS.

(By Cyril G. Hopkins, Ph. D., Chief in Agronomy and Chemistry.)

Gentlemen of the Advisory Committee from the State Farmers' Institute:

In a report which I made about one year ago, regarding the investigation of Illinois soils, I stated that plans were then made to begin the investigation of soils of the most important areas in the State. The methods of investigation were to include:

1. Collecting and analyzing representative samples of the most extensive areas of distinct types of soil to be found in the State in order to determine what stock of the different elements of plant food is contained in each type of soil;

2. Conducting pot culture experiments under controlled conditions in the pot culture laboratory at the university, and also plot experiments under natural field conditions in different sections of the State, to determine in terms of productive capacity, or crop yields, the value of the different kinds of soil treatment and the effect of applications of different elements of plant food, to the different soils of the State; and

3. Beginning a detailed survey, in which the different soils of the State should be mapped so as to show their exact location, extent and boundary lines, in which survey we hoped to secure some coöperation from the bureau of soils of the United States Department of Agriculture.

I will ask you, then, to keep in mind the fact that we have in progress in Illinois two soil surveys of the State. The first of these we call the general soil survey, and the second the detail soil survey. In the general survey we are covering practically the whole State almost from the beginning of the work, while with our present facilities and appropriations it will require many years to extend the detail survey the entire State.

GENERAL SOIL SURVEY.

In beginning the general soil survey, we have found that the soils of the State differ markedly according to the time and method of their original or geologic formation. The work on the glacial geology of Illinois which has been done by Leverett and others connected with the geological survey has been of very great value in starting the soil investigations in this general survey work, and this first division of the State into large soil areas, as shown in our general survey soil map, is based largely upon Leverett's glacial map. I hope it will be understood and borne in mind not only that we are studying Illinois soils and not glacial geology, but also that I do not wish to be held strictly to account for the technical geologic exactness of all the divisions or different areas which we make for the purpose of agricultural investigation and regarding some of which, in fact, even geologists differ.

According to geological investigations there have been three different times when glaciers, or ice sheets, have covered more or less of the State of Illinois, in consequence of which nearly all of the surface of the State is covered by soils of glacial formation. The first glacier covered all of Illinois as far south as the Ozark Spurs, excepting a part of what is now called Calhoun county and a small area in the northwest corner of the State. The area where the drift, or debris, left from this first glacier still remains, the surface is called the Illinoisan Glaciation. For our purpose in soil investigation we divide the Illinoisan Glaciation into three areas, because of the marked difference in the agricultural values and properties of the soil. These three areas we will call the Lower Illinoisan Glaciation, the Middle Illinoisan Glaciation, and the Upper Illinoisan Glaciation, each of which will be more full described later.

The second glacier covered only three or four tiers of counties from the north line of the State, but the area did not include the extreme northwest corner of the State. Where the drift from this second glacier is now the surface, it is termed the Iowan Glaciation.

The third and last glacier covered approximately the north-east quarter of the State and this area is called the Wisconsin Glaciation.

According to the formation we have about ten large soil areas in the State, although each of these areas may contain several different types of soil:

1. Unglaciated soil.
2. Illinoisan Moraines.
3. Lower Illinoisan Glaciation.
4. Middle Illinoisan Glaciation.
5. Upper Illinoisan Glaciation.
6. Iowan Glaciation.
7. Wisconsin Moraines.
8. Wisconsin Glaciation.
9. Areas of deep Loess deposits.
10. Sand, swamp areas, and bottom land.

Because of their evident greater need of immediate investigation, Nos. 1, 3 and 7 have been given rather more study than the other areas.

1. UNGLACIATED SOIL.

The unglaciated soils of the State are those which have been formed in place from the original rocks and have never been covered by glacial drift. The unglaciated soil area includes (1) the seven southern counties in the State: Union, Johnson, Pope, Hardin, Alexander, Pulaski and Massac, and parts of the adjoining counties on the north (occuupied by the Ozark Spurs and territory south of them, the progress of the glacier toward the south evidently having been stopped by the Ozark hills), (2) most of Calhoun county, and (3) the area in the northwest corner of the State, principally in Jo Daviess county. (This area has evidently been protected from the ice flow by a range of hills lying just north of it in Wisconsin) Our investigations of the unglaciated soils have been confined chiefly to the so-called red clay hill soils in the extreme southern part of the State. Briefly, I may state that by chemical analysis we have invariably found these old worn hill soils to be markedly acid, or sour, very deficient in nitrogen, and only medium in phosphorus content. Quantitative determinations of the acid in the soil show that from 500 to 1,000 pounds of lime per acre are usually required to correct or neutralize the acid in the plowed soil (4 to 7 inches deep, and that much larger quantities are required to neutralize the acid in the sub-soil. As it is absolutely necessary to grow leguminous crops in order to restore the nitrogen in the soil by the only rational and economical method, that is, by taking it from the free and unlimited supply of the atmosphere, and, as our most important and valuable legumes, such as red clover and alfalfa, cannot be grown successfully on acid soils (and no legumes can be expected to do their best on such soils), the application of some form of lime to these old hill soils seems absolutely necessary for restoring their productive capacity to any satisfactory degree.

Pot-culture experiments have shown that liberal applications of nitrogen in available form have produced a remarkable increase in wheat yields on these old, worn hill soils.

In this connection, let me state, tentatively, that experiments conducted and now in progress indicate that leguminous crops and leguminous green fertilizers will produce a greater increase in the productive capacity in the soil than heavy applications of commercial nitrogen; and let me express my opinion that no Illinois farmer can afford to purchase a pound of commercial nitrogen for ordinary farming. Probably market gardeners whose lands are too valuable to wait for legumes to grow, and who take off several crops of high market value each season, can well afford to make use of commercial nitrogeneous fertilizers, but probably farm-yard manure is the best and cheapest nitrogenous fertilizer they can purchase.

As you know, our field experiments include the use of leguminous crops in improving the soil, and we have an experiment field on this unglaciated hill soil near Vienna in Johnson county, but of course we shall require one or two years more before we can secure any results from such rotation work, even this first year's crop not being all harvested at this date (September, 1902).

2. ILLINOISAN MORAINES.

The soil area known as Illinoisan Moraines includes the broken moraines or hills which rise above the general level of the surrounding prairie land, resulting from the glacial drift left in great piles, or ridges, and represent the place where the forward movement of the terminus, or edge, of the glacier was practically counterbalanced by the melting away of ice. Those moraines cover considerable areas in Christian, Montgomery, Fayette, Bond, Clinton and in some adjoining counties, and are also found in Fulton, McDonough, Hancock, Adams, Pike, and to some extent in other counties in that section of the State. As a rule these soils are slightly acid and will be benefited by applications of a few hundred pounds per acre of some form of lime, especially for the growth of clover, alfalfa and other leguminous crops. As yet we have no experiment field on this soil, have conducted no pot-culture experiments, and our analytical work is only begun. This is because the area is much more limited than many other soil areas in the State.

3. LOWER ILLINOISAN GLACIATION.

The soil area which we term the Lower Illinoisan Glaciation comprises all or parts of about 30 counties, lying north of the Ozark Spurs, south of the Shelbyville Moraine (the most southern moraine of the Wisconsin Glaciation) and east of the range of broken Illinoisan Moraines which extend from Christian county to St. Clair county. Fayette, Effingham, Jasper, Marion, Clay, Richland, Washington, Jefferson, Wayne, Perry, Franklin, Hamilton, and more or less of all all adjoining counties are included in this soil area. Aside from the moraines, which are classed in the area previously described, the soils of this area consist of level upland, broken hill land, and river bottom land. The level upland is by far the largest part of the area and our investigations have as yet been confined chiefly to this type. The soils of the Lower Illinoisan Glaciation are usually very light colored, in places almost white.

The chemical analysis of a considerable number of samples of the common prairie soil, the principal type of this area, shown that it is almost invariably strongly acid and quite deficient in phosphorus. As a rule, it is rather poor in nitrogen and not abundantly supplied with potassium. The soil needs heavy applications of lime. As a rule, it will require a ton of lime per acre to correct the acidity to a depth of 12 or 15 inches, and much larger applications will be required if the acid in the subsoil must also be neutralized. We are conducting experiments to determine to what depth this soil acidity must be corrected for the most profitable improvement of the soil.

Because of the acid condition of this soil, red clover will not grow upon it, and even the less valuable substitute, cow peas, which are killed by the frost and do not live over winter, will not grow nearly so well as they do in other places in the State upon soils which are not acid. We have found that applications of lime to this soil increase the growth of legumes and markedly increase the number of tubercles upon the roots, showing that the power of the plant to secure nitrogen from the atmosphere is enlarged, thus enabling it not only to increase its own growth but to improve the soil. Where we applied lime last spring we now find that the plowed soil to a depth of 7 inches is not acid, although it is still strongly acid in an adjoining plot where no lime has been applied.

Understand that we bave had only one season to study this problem of the acidity of this great area of southern Illinois soils; that one year ago there was not even a method known to science by which the quanity of acid in soils could be determined, that we have been obliged to work out such a method; and, I am glad to say that we have succeeded, so that we can now tell, not only that a soil is acid, but how acid, and how much lime will be required to correct or neutralize this acid to any depth we choose to take our samples.

We can already see some marked results from applications of lime although we cannot hope for the full benefit of it until at least one year after it has been applied and it has become well incorporated with the soil, and even then we need one or two years more to grow leguminous crops and to follow them by other crops before we can have anything like complete data. I am glad to state, however, that some of the men with whom we have soil experiment fields located on this soil and who have been watching the experiments very closely are already purchasing considerable quantities of lime. For example, Mr. A. A. Hinkley, of DuBois, Washington county, has already applied two car loads of lime to the soil on his farm and will use more this fall.

We are not only trying to determine how much lime must be added and to what depth in the soil the acidity must be corrected, but we are also trying to determine what is the best and most economical form of lime to use for this purpose. We are trying fresh burned lime, air slacked lime, and pulverized limestone, any of which can be obtained in the market in any quantity desired, and any of which will correct the acidity of the soil. The only question is which form can be applied the most economically and give the quickest and most profitable returns.

In our experimental work we are this year using five car loads of lime and three car loads of finely pulverized limestone. In this connection I beg to state that these extensive experiments are only made possible because of the interest taken in the work by the Marble Head Lime Company, of Marble Head, Ill., the Crystal Carbonate Lime Company, of Elsberry, Mo., (who furnished the pulverized limestone), J. P. Speed & Company, of Milltown, Ind., the Southern Railway, the Illinois Central Railway, the Big Four Railway and the Wabash, Chester & Western Railway, all of whom have either furnished large quantities of such materials which we have asked for or transported car load lots of it free of charge. You will see that we are not only making use of all the appropriation furnished by the State, but we are doing considerably more than we could do with those funds alone. I may say further that the Armour Fertilizer Works, Union Stock Yards, Chicago, and the German Kali Works, New York, have furnished us large quantities of bone meal (phosphorus fertilizer) and potash salts, respectively, free of charge. And in no case are we experimenting with anybody's brand of fertilizer. These different parties have furnished us exactly what we asked and what we need to use in investigating the needs of Illinois soils for increasing their productive capacity.

Most af the soils of the lower Illinoisan glaciation are level prairie land and, in this respect, are equal to any in the State for agricultural purposes, but, while these soils are now producing three-quarters of a ton of timothy hay per acre as the principal crop (aside from apple orchards), and 15 to 25 bushels of corn, and with scarcely a good field of clover to be seen on the principal type of soil in this area, and the land worth $20 to $30 an acre—just a few miles north, in Coles and other counties in the Wisconsin glaciation, every other field is a clover field, corn yields from 50 to 75 bushels per acre and land is worth $125. There are other differences in the properties of those two adjoining soil areas, but the principal one is the acid in the soil of the southern area. We expect, within one or two years, to have practical demonstrations on several fields in this soil area to show whether liming the soil will be beneficial for red clover, alfalfa, etc.

As stated above, the soils of the lower Illinoisan glaciation are not only markedly acid, and consequently require heavy applications of lime, but they are also quite deficient in phosphorus. They are not altogether peculiar, however, in being somewhat deficient in phosphorus, because many of the soils of Illinois are below the normal fertile soil in this element, and, furthermore, applications of phosphorus to other soils have produced some markedly beneficial results, as has been shown, for example, in our Bulletin No. 76, "Alfalfa on Illinois Soil."

Our experiments include not only trials to determine the value of applying phosphorus to these southern Illinois soils, but also trials to determine what form is most economical to purchase. Bone meal containing 20 to 25 per cent of phosphoric oxid (8 to 10 per cent of phosphorus) costs about $25 a ton, while ground rock phosphate, which is just as rich in phosphorus, costs only $4 a ton at the mine in Tennessee, or about $6 to $8 per ton delivered in Illinois. The phosphorus in the bone meal is more readily available, and, consequently, gives quicker returns, but the ground rock phosphate is more lasting; and the question is, if equal values (not equal quantities) of the two materials are applied, will not the ground rock phosphate prove more profitable in the course of a few years? Probably we shall require at least five years to answer this question.

The broken hill land of the lower Illinoisan glaciation lies along the streams. The so-called hills are no higher, and usually not quite so high, as the surrounding prairie. They are simply ridges left between the valleys which have been worn out by washing during the time which has passed since the glacial age. The soils of the bottom lands are largely composed of the top soil washed down from the uplands, with occasional sand bars formed by the currents of the streams. Along the larger streams, especially those whose source is in the Western glaciation, the lower bottom lands usually contain more or less soil which has evidently been washed down from the Wisconsin glaciation. These soils are dark colored, practically free from acid, and when not injured by overflow they produce clover and other crops as well as the soils in the Wisconsin glaciation.

4. MIDDLE ILLINOISAN GLACIATION.

This soil area consists chiefly of Cass, Menard, Logan, Scott, Morgan, Sangamon, Green, and parts of Macoupin, Jersey, St. Clair, Clinton, Bond, Montgomery, Christian and Macon counties. In the area just defined and, in fact, in all of these large soil areas, there are several markedly different types of soil and there is usually no very distinct and continuous boundary between two soil areas. Besides the timber land, the broken or hilly land, and the bottom lands, there are frequently bodies of level prarie land which are unlike the common or principal type in the area, and they may or may not resemble the principal type in some adjoining soil area. An investigation of all these different bodies or types of soil is important and should be carried on, but that is the work of our detail survey (which will be briefly described later), and it cannot be done in our general survey work in which we study only the very largest and most important types in these large soil areas.

The soils of this area are markedly different from those of the Lower Illinoisan Glaciation, the principal type being dark brown in color, and very slightly acid. The subsoils are usually free from acidity, so that a light application of lime (600 to 800 pounds per acre) will entirely correct he total acidity of the soil. That such an application would prove very profitable for increasing the growth of clover and consequently of other crops which follow clover, is practically certain. It would be equally beneficial for growing alfalfa.

The analysis of soils from this area shows that they are not abundantly supplied with phosporus. In some places where continuous cropping with wheat and other grain crops has been practiced, the nitrogen content is becoming very much reduced. The acidity of the soil is increasing under cultivation as it usually does, as is evidenced by the fact that in many places where clover formerly grew, it is now frequently a failure.

5. UPPER ILLINOISAN GLACIATION.

This area includes the chief part of Henry, Stark, Peoria and counties to the southwest of these lying between the Mississippi and Illinois rivers, excepting the unglaciated part of Calhoun county, the Illinoisan Moraines, the loess soils and the river bottom lands, which belong in other soil areas.

The level prairie land in this area constitutes the principal type. The soil resembles somewhat that of the Middle Illinosian Glaciation but it is darker (almost black) in color and generally deeper to the subsoil. It is but very slightly acid, as a rule, but, in places where it is found difficult to secure good crops of clover, an application of a few hundred pounds of lime per acre should be made, and it is not improbable that on old worn fields of this type applications of phosphorus will increase the yield of crops, although we have no data on this point, except that the analysis of the soils shows a much more abundant supply of potassium than of phosphorus. The broken or hilly lands along the Mississippi and other streams in the Upper Illinosian Glaciation are usually quite markedly acid and for growing legumes will be greatly benefitted by an application of 1,000 to 2,000 pounds of lime per acre.

6. IOWAN GLACIATION.

This soil area represents all that is now exposed of the drift material from the second glacier. It includes the counties of Stephenson, Winnebago, Boone, Carroll and Ogle, and parts of JoDaviess, McHenry, DeKalb, Lee and Whiteside. Geologists are still in doubt regarding the exact origin of different parts of this section. Probably the western part of the area was of earlier formation than the eastern part. The principal type of soil is rolling prairie. The soil is brown or dark brown in color. The basis of this soil is largely silt (a grade of soil particles which are finer than fine sand), with some fine sand. It contains but little plastic clay even in the subsoil. In my judgment this soil where it is not acid will be found admirably adapted to growing alfalfa, although it may sometimes winter kill in places when too much exposed, especially if cut too late in the fall. This area contains a considerable extent of so called limestone soils, but as a matter of fact the soils have been formed from glacial drift (chiefly pulverized sandstone and granite) with more or less loess on top, and consequently are not limestone soils. In this connection it may be said that the presence of limestone a few feet beneath the surface and even the presence of lime in the well water is not absolute evidence that the surface of an old worn field is not in need of an application of lime. Indeed from the analyses which are in progress of samples from this area we find that some of the long cultivated soils are already distinctly acid, even where they are underlaid by limestone at a depth of 15 to 20 feet. An application of a few hundred pounds of air slacked or water slacked lime, or probably of the finely pulverized limestone, such as is used extensively in this soil area as a top dressing for stone roads and could be easily obtained by pulverizing the underlying lime rock would prove very advantageous and profitable for leguminous crops and consequently for subsequent crops.

Our chemical analyses of soils from this section are not completed, and our data and exact information regarding the needs of this soil area are as yet very meager.

7. WISCONSIN MORAINES.

While the moraines of the old Illinoisan Glaciation have been much eroded and now exist only in broken chains of hills or ridges the moraines of the much more recent Wisconsin Glaciation are as a rule broad and continuous, and represent very large areas of land. Aside from the earlier formed terminal moraine which was piled up at the outer edge of the glacier and which now marks the south and west border of this soil area, and which extends in a sort of semicircle through the counties of Edgar, Coles, Shelby (most of it is known geologically as the Shelbyville Moraine), Macon, De-

Witt, Tazewell, Peoria, Marshall, Bureau, Lee, DeKalb and McHenry, there are many later formed moraines of large extent, as are found especially in Vermilion, Ford, McLean and Livingston counties, and also in the counties in the northeast corner of the State.

There are several different types of soil on the Wisconsin moraines. Indeed the types in this soil area vary from beds of gravel, in places along the edges of moraines, to inclosed individual swamps. Nevertheless, the principal type is the rolling prairie soil varying in color from a brown or dark gray to black, with a mottled reddish brown and yellow subsoil usually found at about 14 to 18 inches below the surface. More or less sand and gravel are commonly present, even in the top soil.

The surface soil is frequently distinctly but not strongly acid, while the subsoil is free from acidity. In places, deeper plowing than commonly practiced will bring sufficient lime from the subsurface soil to correct the acidity of the top soil, but, as a rule, an application of 400 to 500 pounds of lime per acre will greatly benefit the soil. This soil is not rich in phosphorus and with some crops and crop rotations it seems very evident that phosphorus can be applied with marked profit. The growth of leguminous crops and the use of leguminous green fertilizers are of great benefit to succeeding crops of corn on this soil.

Several analyses have been made of this soil from different places, pot cultures have been conducted and field experiments are in progress. Nearly all results 'obtained show the need of light applications of lime and the great value of growing legumes (the nitrogen content is above normal) or of making liberal use of farm-yard manure. The experiments already reported in our Bulletin No. 76, "Alfalfa on Illinois Soil," give some exact data regarding this type of soil, and I will not take more time to discuss it here.

8. WISCONSIN GLACIATION.

While this term in its strict geological sense really includes the total area covered by the latest glacier, it is here used principally to designate the ordinary level or very slightly rolling prairie soil of this area. This is a black soil—the commonest type of soil found in DeKalb, LaSalle, Grundy, Kankakee, Iroquois, Putnam, Marshall, Woodford, Livingston, McLean, DeWitt, Macon, Piatt, Champaign, Moultrie, Douglas, Coles and Edgar counties, and it is found more or less abundant in about a dozen other adjoining counties. Like the Wisconsin Moraines, this area was of later formation in the extreme northeast corner of the State than in the counties further south. This is a soil which apparently is not in so great need of immediate investigation as many other types, and as yet it has received but little attention. When well drained and well cultivated, this soil produces from 60 to 80 bushels of corn in favorable seasons. It grows clover well. Broom corn is grown very extensively on this type of soil in Douglas, Coles and Edgar counties. Some representative samples of this soil have been collected and will be analyzed during the coming year.

9. AREAS OF DEEP LŒSS DEPOSITS.

This type of soil is of more recent formation than the Illinois Glaciation (which is, itself, usually covered with more or less lœss), but evidently it is older than the Wisconsin Glaciation. It occupies long, narrow strips of land bordering the Wabash, Illinois and Mississippi rivers. The lœss deposit consists of very fine sand and of the still finer material, silt, together with some proportion of clay. It varies in thickness from a few feet to more than 50 feet. It has evidently been transported and deposited by winds, at least to some extent. It frequently contains light shells of lime carbonate. The surface of the soil on old cultivated fields is usually distinctly acid, but at a depth of a few feet the acid disappears and lime carbonate is found, frequently in the form of small concretions of varying size and of odd and curious shapes. Evidently these concretions have all been formed in place since the lœss deposit was made, the carbonic acid and other acids of the soil having dissolved the lime in the surface soil and carried it to lower depths, where it has solidified and filled the cracks and cavities in the earth.

In many places (especially upon old cultivated land) clover is a very uncertain crop on this soil. A field of it usually presents a "patchy" appearance. Along the brow of slopes and even on the slopes themselves the clover and also the crops which follow are frequently as good or better than on the level land. This is due to the fact that the surface soil on the level is acid, while the hillside soil where the original surface has been washed off contains lime. This loess soil has no true subsoil. Aside from the larger quantity of organic matter contained in the surface, the texture is quite uniform to considerable depths, although at a depth of 40 to 50 feet the material is somewhat coarser, consisting chiefly of fine and medium sand. The loess soil is usually quite rich in potash, but it is not well supplied with phosphorus. It should be given an application of about 1,000 pounds of lime per acre, and then be improved by legumes or manure. If this is to be done, applications of phosphorus will greatly assist in improving the productive capacity of the soil and will undoubtedly prove profitable.

10. SAND, SWAMP AREAS AND BOTTOM LANDS.

This soil area comprises all of the most recently formed soils in the State, and includes many of the markedly different types, such as the almost pure sand of the sand dunes or sand hills (where in places the sand is still blown or drifted by the wind), the alluvial sands or sandy loams of the river bottoms, the heavier loam and clay loam bottom lands, the plastic clay soils of drained and undrained river marshes, and even the swamp and peat soils which are found in the State.

These soils are widely scattered over the State and nowhere occupy such compact territory as many of the areas above described.

(a) Sand Soils.—The sand soils are chiefly in Tazewell and Mason, and in Lee, Whiteside, Bureau and Henry counties, and along the principal river bottoms. The lighter drifting sand soil is very deficient in all elements of plant food. It is apparently best adapted for some form of fruit, such as peaches (if they would not be winter killed). When heavily manured, it is well adapted to growing melons, sweet potatoes, etc. We have an experiment field near Green Valley, Tazewell county, on this type and have some hopes of growing alfalfa and possibly some other deep rooting legumes on this soil.

(b) River Bottom Soils—The river bottom soils are exceedingly variable, depending much upon the source of the material from which they are made. We are accumulating considerable information regarding several types of bottom land, but I shall not try to give details regarding it at this time.

(c) Swamp Soils—The swamp soils of the State are quite extensive and greatly in need of investigation and we are giving them considerable attention. We have a university soil experiment field in Whiteside county and another in Kankakee county on swamp soils. The chemical analyses, the pot cultures, and the field experiments show that, as a rule the swamp soils are deficient in potassium, and the applications of potash salts are very profitable on most of those soils.

Another special difficulty with many of the swamp soils is that they contain too much magnesia and in some cases probably too much lime. We are now conducting pot culture experiments to try to determine how much magnesia plants can tolerate in the soil; that is, what percentage may exist without producing a poisonous or injurious effect. We are also trying to discover if there is any practical method by which the poisonous effect of magnesia can be corrected.

Recently drained swamp soils are frequently lacking in soil bacteria, especially those bacteria which have to do with the decomposition, oxidation and nitrification of organic matter of soils and the consequent liberation of plant food from the soil. Because of this the growing crops practically starve, although the soil may be rich in all essential elements of plant food. The bacteria can be supplied by light applications of normal cultivated soil or earth. The same results may be accomplished by light applications of manure, particularly of horse manure, which is usually so thoroughly infected with bacteria that it not only rapidly decomposes itself but it greatly increases the rate of decomposition of the organic matter of the soil. In this connection it may be well to call your attention to the fact that even ordinary fertile soils do not contain in solution at any one time sufficient plant food to produce a single crop, but that during the growing season the plant food is liberated gradually from the soil and chiefly by the action of the soil bacteria.

(d) Peaty Soils—The peaty soils are of limited areas. Those we have studied are chiefly in Tazewell and Mason counties. They are found to be very rich in nitrogen and fairly well supplied with phosphorus, but very deficient in potassium. Applications of potash salts are proving of great value and profit on these soils, and they are now being used by the farmers over the principal areas of peaty soils.

Now, of course, I have given you only an outline or summary of the work we are carrying on in our general survey of Illinois soils. With the assistance of my associates in this work we shall soon have ready for publication in bulletin form much more complete information regarding the progress and results of these investigations than I could include in this report. In general I may add that the field experiments of the present season are as successful as we could reasonably expect them to be. In some places in southern Illinois, dry weather has greatly injured our crops, while in places in the north-central part excessive rains and overflows have been injurious and will prevent our securing the most reliable and useful results. Because of such season, injuries or damages and uncontrolled influences, field experiments usually require a much longer time than pot cultures to yield reliable information, although the field experiments have the advantage of being under the outside natural conditions and they also serve as practical demonstrations in the section where they are conducted.

DETAIL SOIL SURVEY.

In beginning the detail soil survey, we first selected two different areas, one (Tazewell county) in the north central part of the State, and the other (Clinton and St. Clair counties) in the south central part of the State. Each of these areas was selected by us because of the large number of different types of soil which they were known to contain. The terminal moraine of the Wisconsin Glaciation crosses Tazewell county, so that the west part of the county contains two of the distinct types of soil of the Wisconsin Glaciation; first the terminal moraine soil occupying the level tops or sloping sides of the hills or ridges; second, the level or gently rolling upland prairie soil. Some soil materials of the Wisconsin Glaciation have also been washed beyond the terminal moraine across the central part of the county and this reworked material has formed some distinct types of soil overlying the till plain of the old glacial drift. The southern part of the county extends into the area of the Middle Illinoisan Glaciation, while the western part of the county contains gravel beds, sand dunes, river bottoms, swamp lands and peat bogs. Thirteen distinct types of soil have been found in the detail survey of Tazewell county, which will serve as a basis for extending the survey into different directions where several of the types established in Tazewell county extend over very much larger areas.

In working out the detail survey a field party goes over the entire area, fixing soil types and locating, as definitely as it is possible to do, their exact boundary lines. Soil maps are made of the entire area surveyed which shew the extent, location and boundaries of each different type of soil. The aim is to have this soil map made to show areas as small as 10 acres. The soil is examined by boring with augres, regularly to a depth of 40 inches, but if necessary to much greater depths. A soil to be mapped under a given type must possess some uniform characteristics in texture (both in surface and soil), in color, in productive capacity (as determined by observed and reported crop yields), and in other properties which can be recognized by one who has become expert in distinguishing and correlating soil types. Ultimately the soils which are classed as a type must stand the test of chemical and physical analysis, pot culture tests and field experiments.

During the first half of the season our field party in detail survey work consisted of two of our own men and two men from the Bureau of Soils. Since June we have furnished three men and the Bureau of Soils one man. The work has been under the joint direction of the Chief of the Bureau of Soils and myself, but one of the most experienced government men has been in direct charge of the field party.

St. Clair and Clinton counties were selected by us for detail survey because they contain all the types of soil between the Mississippi river bottom and the center of the lower Illinoisan glaciation, or white soil area. After both of the selected areas were completed, the field party was placed in Clay county, and this has also been completed; so that we now have finished the detail survey of four counties in the State. Representative samples of soil have been taken from each of the different types of soil in all of the detail survey, and these will be analyzed as rapidly as possible. We also hope in the near future to carry on pot culture experiments with all these different types of soil, and, as far as possible and advisable, to conduct field experiments upon each type. The soil maps will never become of the greatest possible value till we have exact information regarding each of the types of soil which are located and defined by the map.

In conclusion, let me say that it is not now possible, and probably never will be practical or possible, for the Experiment Station to investigate and analyze soils which represent only one man's field or farm. You will readily understand this from the fact that the present total annual appropriation for soil investigation amounts to less than 5 cents for each quarter section of Illinois land, while the cost of only analyzing a single sample of soil amounts to about $25.

I am very glad to report to you that we have made no analyses and have carried on no investigations of soils which are of only local or private interest, and, with very few exceptions, there has been no demand upon us by Illinois citizens for such private work at public expense. Analyses of miscellaneous samples of soils collected by unauthorized and untrained persons, by inaccurate and non-uniform methods, usually imperfectly representing a mere patch of ground, and frequently little more than the hole it is taken from, are of very little value even to the owner of the piece of land, and certainly of very little value to the agriculture of a State. On the other hand, it is possible to classify the soils of the State, first, into large soil areas according to their principal soil types, and finally to map all of the different types in detail and to investigate them carefully, ultimately to secure exact and reliable and most valuable information, not only regarding the principal types in large soil areas (as we have already done and are doing), but also regarding the distinctly different types of soil even of more limited extent within these larger areas (as we plan and expect to do).

It is my duty to add that the appropriation of $10,000 per annum, made by the last General Assembly for beginning an investigation of Illinois soils, has made a beginning.

It has discovered that nearly one-third of the soils of the State are strongly acid and consequently will not grow red clover and other legumes successfully until treated with lime, and that some other soils of the State are slightly acid and will be greatly benefited by light applications of lime.

It has discovered that the old worn red clay hill soils, abundant in seven counties in the extreme southern part of the State, are still well supplied with phosphorus, but that they are exceedingly deficient in nitrogen, and that, if treated with lime and cropped with nitrogen gathering legumes, their productive capacity may be greatly increased.

It has discovered that the great white soil area in southern Illinois is deficient in phosphorus, and that an intelligent use of phosphorus in connection with lime and legumes will undoubtedly largely and profitably increase the productive capacity of 30 counties of Illinois soil.

It has discovered that not only the peaty soils of Tazewell and Mason counties, but also very uxtensive swamp areas in north-central Illinois are very deficient in potassium, and that moderate applications of potash salt greatly increase the productive capacity of those soils.

It has discovered that the alfalfa bacteria are not generally present in Illinois soils, in consequence of which alfalfa has been pronounced a failure in Illinois for the past 20 years, but that these bacteria can be easily and profitably added to our soils and that then, under favorable conditions, alfalfa thrives in Illinois and has been made to produce from eight to ten tons of alfalfa hay per acre in several places in the State during the past season.

Gentlemen, there are other results, but let me say that I firmly believe any one of the discoveries mentioned above is worth to Illinois agriculture and to the commonwealth at least 100 times the total appropriation which has been made for the investigation of her soil.

But, remember that only a beginning has been made. We need to do more. We need to extend the general soil survey at once to all the large soil areas in the State; we need more soil analyses, and more soil analysts; we need more apparatus; we need more room and facilities for pot culture experiments; we need more experiment and demonstration fields on different soil areas and in different sections of the State; we need to follow up the detailed soil survey, not only of the four counties which we have covered, but of the entire State of Illinois. In my judgment, gentlemen, there is needed, and could be used to the advantage of this great State, at least $25,000 per annum for the investigation of Illinois soils. The appropriation made by the last General Assembly was the first which has ever been made by the State of Illinois for an investigation of her soils. For the tremendous magnitude of the task, the appropriation was exceedingly small; but even great undertakings are probably best begun on a small scale, and by safe and well tried methods, that the appropriation may all be well used and none wasted; and the funds which were appropriated were all you asked for, and they have made a good beginning; but, in my judgment, the actual needs of this great State demand that you should ask for larger appropriations from the next General Assembly for this great work. Illinois has a dairy section; she has a fruit section; she has an apple belt and a corn belt; but Illinois has no soil belt. As agriculture is the support of the State and the nation, so the soil is the support of agriculture. "The wealth of Illinois is in her soil, and her strength lies in its intelligent development." All of the people are interested in Illinois soils, in the maintenance of her soil fertility, in increasing the productive capacity of Illinois lands; and they are desirous of learning as quickly as possible the most reliable and economic means of bringing about these results. Strictly speaking, these investigations are an investment rather than experiment. It is largely a question of work. With the continuation of the present appropriations, it will require about 30 years to cover the entire State. If the appropriations can be increased from $10,000 to $25,000 per annum, the work can be done in 10 or 12 years—that is, in time to be of real service to the people who are now living; and I frankly assert that any thoughtful man will agree that the appropriation suggested is exceedingly small compared with the interests involved. Consider, if you please, that an amount equal to that already appropriated by Illinois for an exhibit at the Louisiana Purchase Exposition ($250,000) would make $25,000 a year for ten years, which would probably enable us to extend these investigations to every quarter section of Illinois soil. Seventy-five years ago these investigations and demonstrations could not have been made, because the exact and scientific methods of work which we now have at our command were not known then. Indeed, during the time of your own past lives the sciences fundamental to agriculture have been really worked ont and developed to their present state of usefulness. The great sciences of geology, physics, chemistry and bacteriology are now the servants of agriculture. They stand before us, as it were, with bowed heads and bared arms, ready to serve in the investigation of Illinois soils, and surely the present and future interests of Illinois and Illinois agriculture require much more exact and abundant information than we now possess regarding the various soils of the State.

I speak earnestly in this matter, solely because I appreciate the great needs of the work and believe in the practical and profitable results to the State I serve. Even though it is out of place, it may not be without result for me to say that I could ask for or expect nothing for myself, my personal salary having already practically reached the limit which is paid to teachers and investigators in the University of Illinois. Larger appropriations for the investigation of Illinois soils mean larger responsibilities and larger opportunities for useful and much needed work.

But I make no request; I ask for nothing. That is your privilege, not my duty. I simply submit to the Illinois State Farmers' Institute the facts and opinions which I possess relating to the investigation of Illinois soils. I assume if the appropriation for soil investigation is increased by the next General Assembly, it will be because it is desired by the Illinois State Farmers' Institute, the same organization which urged the last General Assembly to make the initial appropriation for these investigations.

Director Allen offered the following resolution:

Resolved, That the superintendent of institutes be instructed to have printed the report of Doctor Hopkins for the said committee in circular form for distribution to the press, the various institutes and institute speakers.

Motion adopted.

Director Burroughs, chairman of special committee to revise the by-laws, reported the following by-laws, which were unanimously adopted on roll call by the following vote: Allen, Bayliss, Burroughs, Chester, Cobb, Coolidge, Davenport, Goodnow, Grimes, Hughes, King, Mann, Mason, Mills, Moore, Newman, Reynolds, Sweet and Wyman. Ayes, 19; nays, 0.

BY-LAWS OF ILLINOIS FARMERS' INSTITUTE.

WHEREAS, By act of the Thirty-ninth General Assembly, approved June 24, 1895, the Illinois Farmers' Institute was created, empowering its board of directors to adopt by-laws for its government and management of its business in connection with the act creating it, hereby adopts the following by-laws, and hereby repeals all former by-laws heretofore adopted by the board of directors.

ARTICLE I.—DIRECTORS.

Section 1. The board of directors of the Illinois Farmers' Institute consists of

1. State Superintendent of Public Instruction.
2. Professor of Agriculture of the University of Illinois.
3. President of the State Board of Agriculture.
4. President of the State Horticultural Society.
5. President of the State Dairymen's Association.
6. One person from each congressional district of the State, elected at the annual meeting of the institute by the delegates present which have been elected by the county institutes of the district, who shall serve for a term of two years and until their successors are duly elected. The even numbered congressional districts electing their directors at the annual meeting of the institute held in 1903, and the odd-numbered in 1904.

Sec. 2. The board of directors shall hold a meeting in the institute rooms in the State House, on the first Tuesday after the annual meeting of the Illinois Farmers' Institute, the old board to dispose of its business, the new board to organize, elect officers and outline its policy for the ensuing year and transact such other business as may come before the board.

Sec. 3. The board of directors shall also meet between the first day of September and the tenth day of October in each year, the date and place to be designated by the president in his call for the meeting.

Sec. 4. Special meetings of the board of directors may be called by the president by giving ten days' notice thereof, or upon a written petition of ten members of the board the secretary shall call a meeting.

Sec. 5. The director of each district, consisting of more than one county, shall, within 60 days after the annual meeting of the Illinois Farmers' Institute, call a conference of his district at some convenient point, consisting of one person selected by each county institute, for the purpose of arranging for the time and place of holding the next county institute and congressional institute in the district and coöperating in the securing of speakers. All necessary expense of one delegate from each county while in attendance at said congressional conference, to be paid by the Illinois Farmers' Institute, upon itemized bills approved by the director of said district.

Sec. 6. Each director shall be the confidential adviser of the board and of the State Superintendent of Farmers' Institutes concerning institute affairs in his district; he shall report to the superintendent at the close of each county institute, upon all matters that seem significant to his work, in order that the superintendent may have a complete knowledge of the actual conditions in all parts of the State.

Sec. 7. The board of directors shall annually fix the salary of the secretary and superintendent of institutes before the election to fill said offices; said salaries shall be paid monthly and shall cover all clerical expenses, including stenographer; said offices may be filled by one and the same person.

Sec. 8. Eleven members of the board of directors shall constitute a quorum for the transaction of business, except as otherwise provided by these by-laws.

ARTICLE II.—OFFICERS.

Section 1. The officers of the board of directors shall consist of a president, vice president, secretary, treasurer, state superintendent of farmers' institutes and auditor, to be elected by ballot by the board of directors for a term of one year, and until their successors are elected and qualified.

Sec. 2. All officers of the board of directors must be members of the board of directors, except the treasurer, secretary and state superintendent of farmers' institutes, who may be other persons than members of the board.

ARTICLE III.—PRESIDENT AND VICE PRESIDENT.

Section 1. The president shall be the chief executive officer of the board of directors; shall appoint all committees; he shall be *ex officio* member of all standing committees; he shall preside over the meetings of the Illinois Farmers' Institute, the board of directors and the executive committee, sign all warrants for expenditures approved by the auditor, executive committee or the board of directors, and perform all duties incumbent on a presiding officer.

Sec. 2. In case of the absence or disability of the president, or in case of vacancy in that office, the vice president shall fill the office.

Sec. 3. In case of the absence or disability of these officers, or in case both offices become vacant, any director or member of the executive committee who is called to the chair shall act as president for the time being, and sign all necessary papers.

ARTICLE IV.—DUTIES OF SECRETARY AND TREASURER.

Section 1. The secretary shall attend all meetings of the board of directors and standing committees, and shall keep a correct record of the same. He shall perform such other duties as usually devolve upon such officer. He shall act as secretary of the annual meeting of delegates and keep a record of same. He shall countersign and issue warrants for expenditures duly approved by the auditor, executive committee or the board of directors, but shall not draw a warrant on a fund unless there is sufficient money in the fund to pay such warrant.

Sec. 2. The secretary shall be custodian of all the records and papers belonging to, and all property owned by the Illinois Farmers' Institute, and shall report an inventory of all property of the Illinois Farmers' Institute to the board of directors at the close of each year; he shall make a detailed annual report in writing to the board of directors at the last meeting of the old board; he shall also make such other reports during the year as the board of directors or executive committee may require.

Sec. 3. The treasurer shall have charge of all funds, keeping a separate account with each fund. He shall pay out the same on warrants signed by the president and countersigned by the secretary, issued on approved bills. He shall, before entering upon the duties of his office, execute a bond signed by not less than two sureties, in the penal sum prescribed by the board of directors, not less than twice the amount likely to come into his possession at any one time. Said bond shall be approved by the board of directors or committee duly authorized by the board to approve the same; he shall make a detailed annual report in writing to the board of directors at the last meeting of the old board; he shall also make such other reports during the year as the board of directors or executive committee may require.

ARTICLE V.—STATE SUPERINTENDENT.

Section 1. The state superintendent of institutes shall have general supervision of institute work in the State under the direction of the board of directors and of the executive committee.

Sec. 2. He shall make recommendations as to lines of work which he believes will prove profitable for the ensuing year, together with general plans for their execution, and estimates of expenses. He shall make such other recommendations to the board of directors as he may deem for the best interests of the institute work.

Sec. 3. He shall visit county institutes and district conferences, when invited to do so by the county institute officers or directors, or when in his judgment the institute work demands such visit.

Sec. 4. He shall have charge of the publication of the annual report and shall insert therein such matters as will advance the agricultural interests of this State, under the direction of the executive committee.

Sec. 5. He shall be librarian of the Farmers' Institute Free Libraries, and shall submit to the board of directors, or to the executive committee for approval, lists of books which he deems ought to be purchased for the use of the libraries when such are needed.

Sec. 6. He shall make a detailed annual report in writing to the board of directors at the last meeting of the old board, of his acts and doings during the year, together with a general summary of the institute work of the State for year; he shall also make such other reports during the year as the board of directors or executive committee may require.

ARTICLE VI.—AUDITOR.

Section 1. All bills of expenditures ordered by the board of directors or the executive committee, and all bills contracted in pursuance of any appropriation shall be referred to the auditor.

Sec. 2. The auditor shall carefully examine all bills and when approved, return them to the secretary with recommendation that warrants be drawn in payment of same. In case a bill is not approved, it shall be referred to the executive committee.

Sec. 3. The auditor shall carefully examine all reports from county farmers' institutes and the bills for expenses for same, and if in compliance with the law providing appropriations for county farmers' institutes, approve the same, and if not approved, refer the same to the executive committee.

ARTICLE VII.—STANDING COMMITTEES.

Section 1. There shall be appointed the following standing committees, the president appointing four members on each committee.

Executive Committee.

Finance Committee.

Legislative Committee.

Committee on Domestic Science.

Committee on Ways and Means of Improving County Farmers' Institutes.

Committee on Agricultural Education in Public Schools.

Sec. 2. The duties of the standing committees, unless otherwise provided for by these by-laws, shall be legislative in character; they shall meet at the same time and place that board of directors' meetings are called, and report to the board of directors the progress made in, and the need of, their respective lines of work.

ARTICLE VIII.—EXECUTIVE COMMITTEE.

Section 1. The executive committee shall conduct the affairs of the Illinois Farmers' Institute in the interval between the meetings of the board of directors, in accordance with the rules and regulations adopted by said board.

Sec. 2. It shall make all arrangements for the holding of the State Farmers' Institute, assigning the time and place.

Sec. 3. It shall prepare a list of speakers for the county farmers' institutes.

Sec. 4. It shall pass on the bills referred to it by the auditor of the board.

Sec. 5. It shall be official adviser of the State Superintendent of Institutes when the board of directors is not in session.

Sec. 6. It shall meet on the call of the president of the board of directors.

ARTICLE IX—FINANCE COMMITTEE.

Section 1. The Finance Committee shall examine the books and records of the secretary and treasurer, and make a detailed report to the board of directors at their annual meeting, and at other times when requested to do so by the board of directors or executive committee, and show the amounts against which no warrants have been drawn remaining under the various appropriations, and the balances in the hands of the treasurer to the credit of each fund.

Sec. 2 It shall report an apportionment of the appropriations to the several funds.

ARTICLE X—LEGISLATIVE COMMITTEE.

Section 1. The Legislative Committee shall prepare the bill or bills to be presented to the Legislature for enactment, and when the same have been approved by the board of directors or executive committee, shall take all necessary measures to have the same enacted.

ARTICLE XI—COMMITTEE ON DOMESTIC SCIENCE.

Section 1. The Committee on Domestic Science shall counsel with the State Domestic Science Association and report upon measures for the advancement of their work.

ARTICLE XII—COMMITTEE ON WAYS AND MEANS FOR IMPROVING COUNTY FARMERS' INSTITUTES.

Section 1. The Committee on Ways and Means for Improving County Farmers' Institutes shall take into consideration the methods adopted in the management of county farmers' institutes, the program given, the arrangement of circuits of institute meetings the employment of speakers, and report to the board any recommendations that may tend to improvement on these lines.

ARTICLE XIII—COMMITTEE ON AGRICULTURAL EDUCATION IN THE PUBLIC SCHOOLS.

Section 1. The Committee on Agricultural Education in the Public Schools shall collect information in regard to the character of the agricultural work being done in schools, the location of the schools in which agriculture is taught, the methods of teaching, and report to the board on the progress being made therein.

ARTICLE XIV—AMENDMENTS.

Section 1. These by-laws may be amended at any regular meeting of the board of directors, by a majority of all members constituting the board of directors voting in the affirmative.

ARTICLE XV—RULES.

Robert's Rules of Order shall govern in all cases not otherwise provided for.

Director Burroughs moved that the secretary have 500 copies of the by-laws printed.

Motion adopted.

The superintendent of institutes made the following report:

To the Board of Directors of the Illinois Farmers' Institute:

GENTLEMEN—I have the honor of calling your attention to the general conditions of the farmers' institute work in Illinois and can assure you that it is being pushed with enthusiasm and enterprise in every county in the State. In response to a request to the secretaries of county institutes for the dates and place of holding their institute meetings I have had many more replies than heretofore so early in the season. Of those answering, one institute will be held in September. (This is an experiment on the part of Champaign county, and the meeting will be largely an out-of-door affair with plowing matches and exhibits. It will be interesting to learn the results.)

Twenty-three institutes will be held in October, most of them in the south end of the State; 16 institutes in November; 24 in December; 14 in January; one in February. An early arrangement of dates and programs foretells better institute meetings.

The enterprise of McHenry, Winnebago and Sangamon counties in making an educational excursion for the young to the University of Illinois is worthy of being followed by other counties.

The young peoples' experimental clubs and special institute sessions for them, growing out of these excursions, are broadening the work of the institute and bringing the boys and girls into its meetings.

The efforts made by several counties of furnishing seed to the boys and girls for the purpose of growing corn and other grains to be exhibited at the county farmers' institute, together with a statement of methods of cultivation used, the character of the soil and the yield per acre, are proving a grand success. These ideas pushed with energy and enthusiasm are not only solving the problem of how to interest the young in the institute meeting, but they are making the meetings more attractive and instructive to all parties. I would recommend that each director endeavor to extend the work on these lines in every county in his district.

In compliance with the instrutions of your executive committee, President Coolidge and your superintendent attended the meeting of the American Association of Farmers' Institute Workers held in Washington, D. C. President Coolidge will agree with me that what we learned at this meeting has broadened our conception of the importance of the farmers' institute work and the possibilities of development on agricultural lines.

We were particularly impressed with the great work undertaken and being done by the secretary of agriculture through the various departments under his charge. We earnestly recommend the farmers generally, and especially institute officers and speakers to keep posted upon the work being done by Secretary Wilson and to make use of the publications and other sources of information available from the Department of Agriculture at Washington.

It was evident from the papers and discussions at this national convention, that the all-important need of the farmers' institute work, is more efficient institute instructors. How to secure them was admitted to be an unsolved problem. Enough competent workers are not available. They have yet to be developed.

Secretary Wilson informed us that there were not enough men in the United States thoroughly educated on scientific agricultural lines to supply the agricultural colleges and experiment stations for instructors and investigators. This being the case, the farmers' institutes cannot expect much help from the college of agriculture under present conditions in Illinois.

Complaints have been made to me by county institute officers in person and by mail, that they could not secure the help asked from the college of agriculture. This is a very unfortunate and seemingly unavoidable condition in regard to university speakers.

The very fact, however, that the county farmers' institutes are asking for university help and are indignant if they do not get it in the quantity and of the quality which they demand and need, is an evidence that the farmers have made great progress on scientific lines.

Those of you who kave kept in touch with the development of the college of agriculture and the farmers' institutes from their beginnings, know that it was a long and tedious task to eradicate the prejudices which existed among the farmers against the university and the instructors from the college of agriculture.

It was the enthusiasm and unselfish devotion of the university men for their work, their desire and ability to give the farmers the instruction they asked for and the help which they needed, that overcame these prejudices and created the present demand for college of agriculture speakers. Unfortunately for the farmers' institutes if not equally for the college of agriculture, many of these men for causes we know not of, are no longer available for institute work in Illinois. Under these conditions every effort should be made to prevent the growth of a new crop of prejudices which may jeopardize our progress in agricultural education.

There should exist the most generous reciprocity of sympathy and mutual helpfulness between the university, the farmers' institute and the farmers of the State. The college people should be willing to use every effort and perhaps undergo some personal inconvenience in order to give the farmers the instruction they ask and absolutely need, while the farmers should stand loyal to the university, and give their hearty support for the maintenanee and up-building of the college of agriculture.

The experience of the various institute organizations of the United States seems to indicate that the best institute instructors are obtained by a system of institute management which gives sufficient compensation to the institute worker to justify him in preparing himself and devoting his time to the work. As the Illinois Farmers' Institute under present conditions is practically thrown upon its own resources for speakers and their development, I would recommend the use of some of the institute funds in helping to compensate a speaker or speakers who are willing to devote their energies and time to the work, and whose services are worth more than the county institutes unaided are able to pay. Such speaker or speakers, whith the subject to be discussed and the terms, to be approved by the executive committee of this board. The speaker, the subject and the proportion of the expense to be borne by Illinois Farmers' Institute to be submitted to the county institutes for their acceptance, if desired.

The board of directors has authorized the collection of information in regard to the qualificatiens and efficiency of institute speakers, through special reports from the director of each district and from the presidents of county institutes. If these reports are made conscientiously and completely, we will then be in position to take another step in the development of institute workers.

I therefore recommend that that the superintendent of institutes be authorized to invite those speakers who have proved of special benefit to the farmers of the State to meet in conference with the board of directors, at the annual meeting of the board, for the purpose of discussing with the superintendent of institutes and the members of the board the methods used in their work, the subjects treated of, the improvements that might be made, and of selecting some topic upon which all prepare themselves and co-operate in its presentation. The expenses of said speakers in attending such conference to be paid from the general fund of the Illinois Farmers' Institute.

SCHOLARSHIPS.

Ninety-eight appointments have been made for free scholarships in the College of Agriculture for the two years beginning September, 1902. Four of these have been withdrawn, leaving 94, who are now at the college, or expect to be in the near future. Quite a number of counties are not represented by scholarships, while others have received appointments. By an arrangement with Registrar W. L. Pillsbury, assignments will not be made to the vacant counties till some time in December, or until all the scholarships have been taken, that the assignments may be made as far as possible to the home district of the students.

FREE LIBRARIES.

The interest in the libraries is growing, and applications are received from all sections of the State. Where a community has received a second library, there has been a marked increase in the use of the books. Ten new libraries with 44 volumes each, have been equipped since July 1, making 121 libraries now in use. Thirty-seven libraries were sent out in the month of September, and there are 24 on hand, ready to meet demands. These will all be called for early in October. As there are but few out to be recalled, I recommend the equipment of ten more libraries at an early date. The bound bulletins are proving useful, while the bulletins in pamphlet form were not taken from the cases.

The library feature of the institute work is silently accomplishing great good in creating a desire for good literature and in teaching both the young and older members of the farmer's family that they can get information of direct personal advantage from reading the right kind of books. I urge you, as directors, to avail yourselves of an opportunity at every farmers' institute you attend, to call attention to the value of the farmers' institute free libraries.

THE ANNUAL REPORT.

The printing of the seventh volume of the annual report is just about completed, and it is expected that it can be bound and ready for distribution early in October. The distribution made last year seemed to give satisfaction, one half of the copies for each county being sent to the secretary, and one-half to the president of the county institute, 80 copies being sent to each director and 60 copies to each county. The balance to be sent out by the secretary.

All of which is respectfully submitted for your consideration.

A. B. Hostetter,
Superintendent of Institutes.

On motion of Director Davenport, the recommendations of superintendent of institutes were adopted by unanimous vote.

The secretary made the following financial statement:

Farmers' Institute Office, Sept. 29, 1902.

To the Board of Directors of the Illinois Farmers' Institute:

Gentlemen—I have the honor to submit herewith a statement of the condition of the several institute funds from the date of the last report of the finance committee, Feb. 25, 1902, to the close of business Sept. 29, 1902.

By action of the board of directors or the executive committee, the sum of $139.29 was transferred from fund No. 7 to fund No. 4; $700.00 from contingent fund to fund No. 4; $195.11 from fund No. 6 to fund No. 4; and $300.00 from fund No. 1 to fund No. 4.

Counting to a fund as "receipts" and from a fund as "drawn," and deducting the amounts of the warrants drawn upon each fund, the following table shows the balances on hand at the close of the fiscal year ending July 1, 1902:

Fund.	Balance Feb. 25, 1902.	Receipts.	Drawn.	Balance July 8, 1902.
No. 1	$829 48		$ 829 48	
No. 2	806 00		720 40	$85 60
No. 3	104 00		100 60	3 40
No. 4	278 86	$1,234 40	1,431 85	81 41
No. 6	195 11		195 11	
No. 7	342 11		342 11	
Contingent fund	700 00		700 00	
	$3,255 06	$1,234 40	$4,319 05	$170 41

This statement includes all bills and contracts made previous to July 1, 1902, except two items of $83.33 each for balance of salary of secretary for the month of May and June, 1902.

After placing to the credit of each fund the amount apportioned by the board of directors from the appropriation for the fiscal year beginning July 1, 1902, and deducting the amounts of warrants drawn on each fund, the following table shows the amount available in each fund for the current fiscal year, and the balance on hand Sept. 29, 1902:

Fund.	Amount available.	Drawn.	Balance Sept. 29, 1902.
No. 1—Office supplies, etc.	$1,300 00	$ 68 66	$1,231 34
No. 2—Salaries	1,785 60	416 66	1,368 94
No. 3—Libraries	2,503 40	427 71	2,075 69
No. 4—General expenses	1,281 41	84 50	1,196 91
No. 6—District institutes	800 00	....	800 00
No. 7—Domestic science	300 00	58 50	241 50
No. 8—Miscellaneous Supt. expenses	300 00	....	300 00
Contingent fund	2,400 00	....	2,400 00
	$10,670 41	$1,066 03	$9,604 38

Respectfully submitted,

A. B. HOSTETTER,
Secretary.

On motion the secretary's financial statement was referred to the finance committee.

Director Chester moved that the finance committee be instructed to make report to the executive committee at the next meeting of said committee.

Motion adopted.

On motion of Director Moore a recess was taken till 8:00 p. m.

INSTITUTE ROOM, 8:00 P. M.

The board met as per adjournment.

Director Rossiter read a communication from Mrs. S. Noble King, secretary of the Illinois Association of Domestic Science, asking for an increase in the apportionment for the use of said association, for the purpose of increasing the number of pamphlets containing the proceedings of the Domestic Science association.

Director Mann moved that the secretary be instructed to notify the secretary of the Illinois Association of Domestic Science, that the annual report of the Illinois Farmers' Institute will contain a full report of the proceedings of the Domestic Science association, and that on receipt of the names of those who desire the proceedings of the Domestic Science association from its secretary, copies of said annual report will be furnished to the parties named without expense to the Domestic Science association.

Motion adopted.

Director Rossiter presented the following preambles and resolutions:

To the Illinois Farmers' Institute:

WHEREAS, Many of the farmer boys and girls, upon arriving at the age of maturity, find themselves deficient in the ordinary branches of education, and cannot avail themselves of farther education in the line of agricultural and domestic sciences, being unable to attend the agricultural colleges where these subjects are taught, and

WHEREAS, Many farmers who have been engaged in agricultural pursuits for years, would gladly avail themselves of the opportunity for scientific study and research in agriculture in all its varied branches, were such an opportunity offered to them; and

WHEREAS, The farmers' institutes established in most of the northern states, together with the agricultural papers, from which the farmers have gained much valuable information from the experience of others, have created a desire for knowledge along these lines, requiring deeper thought and study of the application of the elements entering into the successful pursuit of agriculture, far beyond that which can be obtained through these agencies; and

WHEREAS, An up-to-date farmer can no longer succeed unless he works along scientific principles, in keeping up the fertility of the soil, the use of his crops to the best advantage, the production of stock best fitted for the uses to which he desires to apply them, all of which must be accomplished by brain work rather than by manual labor; and

WHEREAS, An up-to-date farmer's wife—and if fact all housewives—should work along similar scientific principles in preparing the food best fitted to furnish strength, energy and vitality, and preserve the health of her family; and

WHEREAS, These people cannot be successfully reached except through a course which can be pursued at their own homes, such as correspondence course, which, through lack of facilities and experience, the agricultural colleges at the present time are unable to furnish; and

WHEREAS, The International Correspondence School of Scranton, Pa., is especially equipped to prepare such a course, having specialized in these courses in 76 or more different branches with unprecedented success, the origination of which, about 11 years ago, was for the benefit of the miners of Pennsylvania, who were in many resoects similarly situated as the farming community at the present time, and which has now become the largest, grandest and most wonderful school of this modern age, having an enrollment at the present time of over 420,000 students; therefore

Resolved, That the Illinois Farmers' Institute, now in session, do most earnestly solicit and request the International Correspondence School of Scranton, Pa., to prepare, at its earliest convenience, suitable courses in agriculture and in domestic science, and that the originator of these courses should bear in mind the general educational condition of the farming community.

That when such courses are prepared the said institute will assist, within reason and consistency, through the county farmers' institutes of the State of Illinois, in informing the public that such courses are obtainable.

That each director be requested to bring similar resolutions before each of their county farmers' institutes held within this State during the coming winter.

That the secretary of the Illinois Farmers' Institute be instructed to prepare copies of these preambles and resolutions and forward them to the secretaries of state farmers' institutes in such adjoining states where such organizations exist, requesting that similar resolutions be presented to all their institutes and then forwarded to the International Correspondence School.

Respectfully submitted.

The question of correspondence schools in agriculture was discussed at considerable length.

Director Hughes moved that the preambles and resolutions offered by Mr. Rossiter be referred to the Committee on Agricultural Education in the Public Schools.

Motion adopted.

On motion, the board adjourned subject to call of the president.

Minutes read and approved, Jan. 9, 1903.

J. H. COOLIDGE,
President.

A. B. HOSTETTER,
Secretary.

ST. NICHOLAS HOTEL, Sept. 30, 1902, 7:30 p. m.

The executive committee met at the above time and place on call of the chairman. Present: Chairman Coolidge and Directors Easterly, Frake, Mann and Wyman.

The secretary presented a bid for packing the annual reports for shipment from M. A. Rankin.

Director Easterly moved that the preparing the reports for shipment be considered part of the duties of the secretary.

On roll call the motion was adopted by the following vote: Ayes—Frake, Easterly, Wyman, Coolidge; nays—Mann. Ayes 4, nays 1.

Director Mann moved that the superintendent offer Mr. Frank H. Hall, for his services, $25.00 for one institue attended in a week and $40.00 for two institutes a week, and that as many appointments as practicable be made for him during the institute season; that if Mr. Hall accept this offer, that the superintendent notify the secretaries of county farmers' institutes that an arrangement has been made to secure the services of Mr. Hall to present the subject of "Teaching Agriculture in the Public School," and that he will attend institute meetings if the county or district institute will pay him $10 and his expenses, the Illinois Farmers' Institute paying the balance to compensate him for such services.

Motion adopted.

Director Wyman moved that the sum of eighty-one and six one-hundredths dollars ($81.06) be transferred from fund No. 4, general expenses, to fund No. 2, salaries.

Motion adopted.

Director Mann moved that the superintendent be instructed to purchase books and equip ten more free libraries.

Motion adopted.

On motion the committee adjourned subject to the call of the chairman.

Minutes read and approved Jan. 9, 1903.

A. B. HOSTETTER, *Secretary.*

J. H. COOLIDGE, *President.*

FARMERS' INSTITUTE ROOM, Nov. 12, 1902,
1:30 o'clock p, m.

The executive committee met on call of Cairman J. H. Coolidge; present, Directors Frake, Easterly, Mann, Wymann and Coolidge.

The secretary stated that the board of directors had referred the minutes of the previous meeting to the executive committee for approval, whereupon the minutes of the board meeting of April 3, 1902, and of the executive committee meetings of April 3 and May 7, 1992, were read and on motion approved.

Director Mann moved that the secretary be instructed to secure 10,000 clasp envelopes for shipping corn samples and to arrange with the breeders of pure bred corn to supply packages of seed corn for the use of the young people of the several counties in growing corn for exhibition at the county farmers' institutes.

The roll being called the motion was adopted by the following vote: Ayes, Easterly, Frake, Mann, Wymann, Coolidge; nays, none.

Director Easterly moved that the secretary be instructed to have 7,000 programs printed for the State institute meeting to be held in Bloomington. Motion adopted.

Director Burroughs, chairman of the auditing committee made the following report.

SPRINGFIELD, ILL., Nov. 12, 1902.

To the Board of Directors of the Illinois Farmers' Institute:

GENTLEMEN—We, your auditing committee, beg leave to report that we have made careful examination of the books, warrants, bills, etc., of Treasurer A. P. Grout and Secretary A. B. Hostetter, and find them to be correct as follows.

In compliance with the action of the board of directors or the executive committee the following transfers and apportionment of funds were made.

From contingent fund to fund No. 4, $1,000. From contingent fund to fund No. 4, $700. From fund No. 7 to fund No. 4, $139.29. From fund No. 6 to fund No. —, $95.11. From fund No. 1 to fund No. 4, $300. Counting to a fund as receipts and from a fund as expenditures the treasurer's accounts show balance on hand on previous previous report, Feb. 24, 1902.

Fund number.	Balance.	Receipts.	Paid out.	Balance Sept. 27, 1902.
1	$ 829 48	$1,300 00	$ 898 14	$1,231 34
2	811 00	1,700 00	1,142 06	1,368 94
3	154 00	2,500 00	496 31	2,157 69
4	733 61	3,434 40	2,948 21	1,219 80
6	456 20	800 00	456 20	800 00
7	342 11	300 00	400 61	241 50
8	....	300 00	....	300 00
Contingent	1,700 00	2,400 00	1,700 00	2,400 00
Total	$5,026 40	$12,734 40	$8,041 53	$9,719 27

The secretary's accounts show balance on hand as per auditor's report Feb. 25, 1902.

Fund number.	Balance.	Receipts.	Paid out.	Balance Sept. 27, 1902.
1	$829 48	$1,300 00	$ 898 14	$1,231 34
2	806 00	1,700 00	1,137 06	1,368 94
3	104 00	2,500 00	538 31	2,065 69
4	278 36	2,434 40	1,515 85	1,196 91
6	195 11	800 00	195 11	800 00
7	342 11	300 00	400 61	241 50
8	....	300 00	....	300 00
Contingent	700 00	2,400 00	700 00	2,400 00
Total	$3,255 06	$11,734 40	$5,385 08	$9,604 38

We find the following warrants drawn which have not been presented to the treasurer for payment:

Fund No. 4:		
1749	$1 00	
1820	8 72	
2071	3 65	
2189	9 72	
		$23 09
Fund No. 3:		
2259	$ 3 75	
2461	88 25	
		92 00
Total outstanding warrnts	....	$115 09

Which accounts for the difference in the balances of the two accounts except for the amount of 20 cents which arise from a warrant being 20 cents.

Your committee find that warrant number 2291 for the sum of $2.65 was raised by some person unknown to your committee, to $2.85 by changing the figure six to eight, this was done between the time it left the secretary's office and the time it was paid by the treasurer June 5, 1902. This accounts for the difference of balances between the secretary's and treasurer's accounts.

Respectfully submitted,

Signed:

E. W. BURROUGHS,
J. H. COOLIDGE.

Director Mann moved that the report of the Auditing Committee be received and adopted.

Motion carried.

Director Frake moved that warrant No. 2291, together with the report of the Auditing Committee, be referred to Treasurer A. P. Grout, to ascertain, if possible, where and by whom the same was changed.

Motion adopted.

Director Frake moved that a duplicate be issued for warrant No. 2163 for the expenses of the Will County Farmers' Institute, the original warrant having been reported to have been lost and not presented to the treasurer for payment.

Motion adopted.

Director Mann moved that the secretary be authorized to purchase books and equip ten more free libraries.

Motion adopted by the following vote: Yeas—Easterly, Frake, Mann, Wyman, Coolidge; nays—none.

On motion, the committee adjourned.

Minutes read and approved, Jan. 9, 1903.

J. H. COOLIDGE,
President.

A. B. HOSTETTER,
Secretary.

INSTITUTE ROOM, Jan. 9, 1903.

In compliance with a call issued by the president, J. H. Coolidge, the board of directors of the Illinois Farmers' Institute met in the Institute Room, State House, Jan. 9, 1903, at 10:30 a. m.

The following directors were in attendance: Aldrich, Bayliss, Burroughs, Chester, Cobb, Coolidge, Davenport, Easterly, Frake, Goodnow, Grimes, Grout, Hughes, King, Mann, Mills, Moore, Newman, Rossiter, Sweet, Wyman.

The minutes of board meeting of Sept. 29, 1902, and executive committee meetings of Sept. 30, 1902, and Nov. 12, 1902, were read and approved.

The question of what should be included in the farmers' institute bill for appropriations for the ensuing two years was discussed fully, and a recess taken until 2:00 o'clock p. m.

INSTITUTE ROOM, 2:00 O'CLOCK P. M.

Mr. Chester, chairman of the Legislative Committee, reported as follows:

To the Board of Directors of the Illinois Farmers' Institute:

GENTLEMEN—Your Committee on Legislation beg leave to report the following bill for an approprtation for the continuance of the work of the Illinois Farmers' Institute and county farmers' institutes:

A bill for an act making appropriation for the Illinois Farmers' Institute and county farmers' institutes:

WHEREAS, To assist and encourage practical education among farmers and for developing the agricultural resources of the State, the Thirty-ninth General Assembly created an organization under the name and style of the Illinois Farmers' Institute, and intrusted to it the development of greater skill in the cultivation of crops, in the breeding and care of domestic animals, in dairy husbandry, in horticulture, in farm drainage, in improvement of highways and general farm management, through and by means of liberal discussions of these and kindred subjects, and practical instruction for improving the conditions of the farmer by affording a better knowledge of successful agriculture; therefore, to sustain the same,

Section 1. Be it enacted by the People of the State of Illinois, represented in the General Assembly: That there be and is hereby appropriated to the Illinois Farmers' Institute the following sums, to-wit:

Sec. 2. For salary of secretary and superintendent of institutes, the sum of two thousand dollars ($2,000) per annum for the fiscal years beginning July 1, 1903 and 1904.

For clerk hire, typewriter, etc., the sum of one thousand dollars ($1,000) per annum for the fiscal years beginning July 1, 1903 and 1904.

Sec. 3. For expressage, postage, office expenses, furniture, etc., the sum of one thousand five hundred dollars ($1,500) per annum for the fiscal years beginning July 1, 1903 and 1904.

Sec. 4. For the purchase of books for, and the maintenance of, the Illinois Farmers' Institute free libraries, the sum of two thousand five hundred dollars ($2,500) per annum for the fiscal years beginning July 1, 1903 and 1904.

Sec. 5. For the actual expenses of the members of the board of directors and the officers of the Illinois Farmers' Institute in the performance of their duties as said members and officers, for the expenses of the State Institute meeting, for the employment of specially qualified institute instructors, and for incidental expenses in promoting the development of the farmers' institute work throughout the State, the sum of five thousand dollars ($5,000) per annum for the fiscal years beginning July 1, 1903 and 1904.

Sec. 6. For the use of each county farmers' institute, for the purpose of holding one or more farmers' institute meetings in each county in the State, under the full direction of the county farmers' institute officers of each county, the sum of seventy five dollars ($75) per annum for the fiscal years beginning July 1, 1903 and 1904, to be paid to the treasurer of each county farmers' institute when such institute shall file with the secretary of the Illinois Farmers' Institute a sworn statement which shows that said county farmers' institute has held one or more duly advertised public sessions annually of not less than two days each, at some easily accessible location, which shall include an itemized exhibit of the expenses of said meeting, with receipted vouchers therefor, a copy of its printed program and report of proceedings, showing title and author of papers read and by whom discussed, place or places of meeting, with average daily attendance, and such other information as may be called for by the Illinois Farmers' Institute and necessary to successfully assist this work.

Sec. 7. No officer nor officers of any county farmers' institute shall be entitled to or receive any moneyed compensation whatever for any service rendered the same.

Sec. 8. That on the order of the president countersigned by the secretary of the Illlinois Farmers' Institute, and approved by the Governor, the Auditor of Public Accounts shall draw his warrant on the Treasurer of the State of Illinois in favor of the treasurer of the Illinois Farmers' Institute for the sum herein appropriated: *Provided*, That each warrant on account of a county farmers' institute shall show the county institute for whose benefit the same is drawn: *Provided further*, That the program and report of proceedings of the county farmers' institute for which each warrant is drawn shall show that some of the following topics have been presented and discussed, viz: grain farming, stock feeding and breeding, dairy husbandry, orchard and small fruit culture, farmers' garden, domestic science, and any subjects pertaining to farm life: *Provided further*, That if the necessary expense of a county farmers' institute shall not equal the sum of seventy-five dollars ($75) as aforesaid, then said warrant shall only be drawn for the sum expended.

Sec. 9. It shall be the duty of the treasurer of the Illinois Farmers' Institute to pay to the treasurer of each county farmers' institute the said sum of seventy-five dollars ($75) or so much thereof as may be received for its use and benefit, as aforesaid, and make annual report to the Governor as provided by law.

Respectfully submitted for your approval and adoption,

E. E. Chester,
J. H. Coolidge,
Edward Grimms,
Fred C. Goodnow.
Committee on Legislation.

On motion of Director Chester the report of the legislative committee was adopted by unanimous vote.

Director Grout moved that a warrant be drawn upon the general expense fund for twenty dollars ($20) in favor of Geo. W. Long, president of Calhoun county, for balance of farmers' institute expenses not previously allowed by the board of directors but duly paid by Mr. Long. Motion adopted.

On motion of Director Easterly the board of directors went to committee of the whole to consider the appropriation to be asked for soils investigations and experiments.

The committee of the whole reported as follows through the committee on soil investigations:

To the Honorable President and Members of the Board of Directors of the Illinois Farmers' Institute.

Gentlemen—We, your committee appointed as an advisory committee to the Dean of the College of Agriculture on Soils Investigation, beg leave to report, to-wit:

The results accomplished by Dr. C. G. Hopkins under the direction of Dean Davenport in the 18 months of the life of our present appropriation, has far exceeded our greatest expectations, and feeling that a more rapid investigation of the various soils than is possible under the present appropriation is desirable, and as the experience gained in the past will enable the college of agriculture to proceed on a much broader plan, therefore we recommend that the Illinois Farmers' Institute ask for an appropriation of twenty-five thousand dollars ($25,000) per annum for continuing the soil investigation.

And whereas, the Illinois Farmers' Institute embraces all the various interests represented in House Bill No. 315, and as it is consequently eminently proper that the Illinois Farmers Institute should take the initiative in the re-enactment of such law, we therefore recommend that the board of directors appoint a committee of two to at once correspond with the officers of the various associations represented in said House Bill No. 315, asking them to appoint committees to meet in a common session in the future, for the purpose of drafting a bill satisfactory to each of said associations. All of which is respectfully submitted.

Signed:

Walter R. Kimzie,
H. G. Easterly,
Ralph Allen,
H. D. Hughes,
E. W. Burroughs,
Committee on Soil Investigation.

On motion of Director Chester, the report of the committee was adopted. The president named Walter R. Kimzey and Frank I. Mann as special committee to carry out the plan of the report.

Director Bayliss, chairman, presented the following report from the Committee on Agricultural Education:

SPRINGFIELD, ILL., Jan. 9, 1903.

To the Board of Directors of the Illinois Farmers' Institute::

GENTLEMEN—Your Committee on Agricultural Education in the Public Schools, to whom was referred the matter of establishment and promotion of a correspondence course of study in Agriculture, designed to benefit such persons in Illinois as for any reason can not attend the Agricultural College, has considered the matter so referred, and begs leave to report thereon as follows:

1. We believe that the value and efficiency of the correspondence method of instruction has been abundantly established, and that this method even has some advantages to the diligent over the ordinary methods of the schools.

2. We believe it is quite probable that there are many persons in Illinois who would be glad to avail themselves of the benefits of a systematic course of reading and study, if they could be assured that such course of study would be applicable to Illinois conditions and problems; among them might be some teachers in the public schools, in which elementary agriculture is coming to be a subject of study.

3. We believe that such a line of work would be in harmony with the expressed purpose in the act creating the Illinois Farmers' Institute.

We therefore recommend that a special inquiry as to the probable cost of an experimental course, and a suitable person to direct the same, be authorized, and that this question be made a special order at the next annual meeting of the board of directors.

Respectfully submitted,

A. BAYLISS,
F. C. ROSSITER,
E. DAVENPORT,
Committee on Agricultural Education in the Public Schools.

On motion, the report of the committee was accepted and the committee instructed to carry out the plans as outlined in the report.

The superintendent of institutes reported that he had a large number of applications for free libraries and inquiries for application blanks and recommended the purchase of 20 more complete libraries.

Director Chester moved that the superintendent be authorized to purchase books for and equip 20 more free libraries.

Motion adopted.

The secretary made the following report of the amounts to the credit of the several funds on Jan. 9, 1903.

Fund No.	Name.	Amount.
1	Expressage, postage, etc	$ 698 32
2	Salaries	616 69
3	Free libraries	1,465 98
4	General expenses	577 06
6	District institutes	607 59
7	Domestic Science Association	185 50
8	Miscellaneous expenses of superintendent	240 28
	Contingent fund	2,400 00
	Total balance on hand	$6,792 81

On motion of Director Hughes the secretary's report was referred to the finance committee.

Director Easterly moved the adoption of the following resolution:

Resolved, That the board of directors of the Illinois Farmers' Institute learns with satisfaction of the beginnings already made in some of the State normal schools, especially the State normal university at Normal, to train teachers to give practical instruction in the elements of agriculture in the common schools.

We pledge our individual and organized support to all efforts made by or in behalf of these schools to obtain from the General Assembly the necessary appropriations to enable them to continue and extend this necessary work in the most effective way.

Resolved, further, That it is the wish and hope of this body that the normal schools will continue to encourage their students to seek employment in country schools.

Motion to adopt the resolutions carried.

Director Grimes moved that the superintendent of institutes be authorized to send samples of pure bred seed corn, to be donated by members of the Corn Breeders' association, to the boys in the several counties of the State for the purpose of encouraging the growing of pure seed corn and of interesting the boys in the county farmers' institutes. The county farmers' institute to be requested to offer prizes to the boys in the several counties for ten ears grown from such seed, the corn to be exhibited at the county farmers' institute. Boys desiring to compete for such prizes and to receive samples of such pure bred corn to inclose 4 cents in postage with their names and address to the superintendent of institutes.

Motion adopted.

Director King moved that the secretary be instructed to remit the annual fees for membership in the Illinois and American library associations for 1902 and 1903.

Motion adopted.

Director Newman moved that the expenses of the members of the soils investigation committee be paid from the general fund for expenses when said committee is called in the interest of this board.

Motion adopted.

Director Burroughs, chairman of the finance committee, reported as follows:

To the Chairman and Board of Directors of the Illinois Farmers' Institute:

We your finance committee to whom was referred the secretary's report beg leave to recommend that one thousand dollars ($1,000) from the contingent fund be transferred to fund No. 4, general expenses.

Respectfully submitted,

E. W. BURROUGHS,
RALPH ALLEN,
E. N. COBB,
MERRILL K. SWEET,
J. H. COOLIDGE,
Committee.

On motion the recommendation of the committee was adopted and the transfer of $1,000 authorized.

President Coolidge asked the members of the board to take up the question of changing the term of office of the secretary and superintendent and treasurer to begin July 1 instead of at the next meeting of the board. On motion the question of amending the by-laws to change the time of these offices was referred to the executive committee to report at the next meeting of the board of directors.

On motion the board adjourned.

Minutes read and approved March 3, 1903.

A. B. HOSTETTER, *Secretary.*

J. H. COOLIDGE, *President.*

ILLINOIS HOTEL, BLOOMINGTON, Feb. 23, 1903.

The executive committee met at 8 o'clock p. m. in the Illinois Hotel, Bloomington, Feb. 23, 1903, on call of the chairmain, J. H. Coolidge. Present: Directors Directors Coolidge, Easterly, Frake, Mann and Wyman.

Director Mann moved that the president and secretary be authorized to draw warrants for the payment of the speakers attending the State Institute meeting and bills incurred at Bloomington for the expenses of same, that all business connected with the State Institute may be settled promptly.

Motion adopted.

On motion committee adjourned.

Minutes read and approved March 3, 1903.

A. B. HOSTETTER, *Secretay.*

J. H. COOLIDGE, *President.*

INSTITUTE ROOM, March 3, 1903,
At 1:30 p. m.

The Board of Directors of the Illinois Farmers' Institute met at the above named time and place as provided by the act creating the Illinois Farmers' Institute. Roll call showed the following members presents: Bayliss, Davenport, Aldrich, Reynolds, Sweet, Rossiter, Hughes, Mason, Wyman, Moore, Coolidge, King, Chester, Grout, Grimes, Goodnow, Mills, Easterly. Total, 18.

The minutes of the board of directors meeting of Jan. 7, 1903, and of the executive committee meeting February 23rd were read and on motion approved. Under the order of the reports of committees, the Committee on Agriculture in the Public Schools made written report.

Director King moved that the report of the committee be accepted. After some discussion of the report, Director Chester moved that Mr. King's motion to accept the report of the Committee on Agriculture in the Public Schools be made a special order for Wednesday afternoon at 2:00 o'clock.

Motion adopted.

Director Wyman moved that Mr. Frank H. Hall be invited to meet with the board Wednesday afternoon and that his expenses be paid out of the general funds of the board.

Motion adopted.

The secretary made the following report:

INSTITUTE ROOM, March 3, 1903.

To the Board of the Directors Illinois Farmers' Institute.

GENTLEMEN—Your by-laws require that your secretary shall make a detailed report of the work of his office. I therefore submit herewith an inventory of the property of the Illinois Farmers' Institute in my care, a financial statement of all bills approved by the auditor or board of directors for which warrants were drawn, giving the number of the warrant, the fund and to whom paid. A statement of the balances to the credit of each fund March 3, 1903. The number of county and district institutes held and the cost of the same, the names and location of those attending the college of agriculture on institute free scholarships and the places where libraries have been located the past year.

There has been a great increase in correspondence in my office due to the wide interest in and demand for the farmers' institute free libraries; the awarding of the free scholarships; the distribution of the annual reports and collecting copy for same; the distribution of seed corn to the boys of the State, and information in regard to the soil investigation and experiments. The latter I have been able in most cases to answer by sending the report made for your Committee on Soil Investigations by Prof. C. G. Hopkins of the college of agriculture.

In view of the general interest manifested in the soil investigations by the people of Illinois, I recommend that full information in regard to the same be published in the next Annual Farmers' Institute Report, with a colored soil map of the State, and other illustrations.

The relations of my office with the several county farmers' institutes have been very pleasant and satisfactory, except in regard to the payment of the county institute bills of expenses. The institute officers complain, and with just cause, of unnecessary delay in remitting for the expenses of their meetings.

This delay could be avoided and county institute officers draw their State appropriation promptly if the board of directors would designate what expenses are legitimate, and, when the bills comply with such requirements, authorize the president and secretary of the Illinois Farmers' Institute to draw a warrant for the amount, without the delay of sending the report first to the director of the district and to the auditor of the board. Orders on the Auditor of Public Accounts for county institute appropriations have to be signed by the president and the secretary and endorsed by the Governor before payment. This, it appears to me, should be sufficient protection to the fund, especially when it is first sworn to by the county institute officers.

In the four years that I have served as secretary of this board only one county institute bill was cut, and that amount was afterward paid by the board of directors out of its own funds.

The growth of the library feature of our work and the necessity for office help makes it imperative that the farmers' institute have more office room than at present. I therefore recommend that a committee be appointed by the board to confer with the proper State authorities for the purpose of securing more office room.

The carpet of the Institute Room is too worn to be cleaned, and the dust from it is so detrimental to the books to be handled and to the health of the occupants and visitors of the room that I recommend, instead of the old or a new carpet, the substitution of manolium or a painted floor and rugs.

INVENTORY OF ILLINOIS FARMERS' INSTITUTE PROPERTY.

To the Board of Directors of the Illinois Farmers' Institute:

Gentlemen—I submit herewith an inventory of the property belonging to the Illinois Farmers' Institute and in my possession March 2, 1903:

One gavel.
One typewriter (Smith Premier, No. 67868.)
One automatic numbering machine (Bates, No. 42778.)
Twenty-two letter filing case.
One account book.
Five books of record.
Several hundred envelopes and a liberal supply of blanks of various kinds.
One roll top desk.
One long committee table.
One rack for filing newspapers.
One hundred and sixty-one library cases equipped with books; the total number of volumes in use, 7,572; of these 5,492 are books of general literature and 2,080 are strictly agricultural books, including reports and bound bulletins.
One library case for office use.
One suit case for carrying papers when on duty away from office.
One tin box with lock, for valuable papers.
Filing cases and cards for keeping records of free libraries.
A few back volumes of annual reports and about 300 copies of Annual Report Vol. VII.

The above includes all the property of the Illinois Farmers' Institute in my care except small desk articles and stationery too numerous to mention.

Respectfully submitted,

A. B. Hostetter.

Inttitute Room, State House, March 2, 1903.

To the Board of Directors of the Illinois Farmers' Institute:

Gentlemen—I have the honor to submit herewith a statement of the condition of the several funds from the date of the last report of the finance committee Nov. 12, 1902, to the close of business March 2, 1903:

By action of the executive committee Sept. 30, 1902, the sum of eighty-one dollary and six cents ($81.06) was transferred from fund No. 4 to fund No. 2, and by action of the board of directors Jan. 9, 1903, one thousand dollars

($1,000.00) was transferred from the contingent fund to fund No. 4. Counting to a fund as receipts and from a fund as disbursements, the secretary's books show the following balances:

Fund Number.	Balance on hand as per report of finance committee, Nov. 12, 1902.	Receipts.	Disbursements.	Balance on hand March 2, 1902.
1	$1,231 34		$ 977 74	$ 253 60
2	1,368 94	$ 81 06	1,041 65	408 35
3	2,065 69		1,026 49	1,039 20
4	1,196 01	1,000 06	1,787 73	459 18
6	800 00		621 75	178 25
7	241 50		78 40	163 10
8	300 00		85 27	214 73
Contingent fund	2,400 00	9,604 38	1,000 00	1,400 00
	$9,604 36	$10,685 44	$6,569 03	$4,116 41

The total balance on hand March 2, 1903, as per secretary's books, $4,116.41.

The bills, as per reports of the auditor, for which warrants have drawn are as follows:

To the Board of Directors of the Illinois Farmers' Institute:

GENTLEMEN—As your auditor, I beg to report that I have duly examined the claims of the parties named below, have approved the same and recommend that warrrants in payment of said vouchers be drawn to the order of the respective claimants for the following amounts:

Warrant number.	To whom.	For what.	Fund number.	Amount.
2278	J. H. Coolidge	Expenses as director	4	$18 73
2279	S. Noble King	..do	4	12 25
2280	Marion Garmony	Stenographic report state meeting.	2	85 40
2281	F. I. Mann	Expenses as director	4	6 36
2282	B. F. Wyman	..do	4	12 65
2283	James Frake	..do	4	6 70
2284	H. G. Easterly	..do	4	12 50
2285	F. H. Rankin	Expenses at Rockford	4	35 16
2286	Irvin Nowlon	Expenses, delegate 16th Dist. Con.	4	2 90
2287	F. E. Smith	..do	4	3 80
2288	Ralph Allen	Expenses as director	4	1 75
	Total			$198 20

Approved May 16, 1902.

Warrant number.	To whom.	For what.	Fund number.	Amount.
2289	Henry McGouch, treasurer.	Kane Co. Farmers' Institute	5	$75 00
2290	George Daab	Expenses, delegate 22d Dist. Con.	4	1 15
2291	Blazer Schmidt	..do	4	2 65
2292	L. A. Spies	..do	4	2 00
2293	Jas. A. Chesney	..do	4	4 33
2294	Rufus Cruthis	..do	4	3 36
2295	E. W. Burroughs	Expenses, director 22d Dist. Con	4	3 50
2296	W. L. Rhodes	Expenses, delegate 19th Dist. Con.	4	1 80
2297	G. M. Glassco	..do	4	3 60
2298	W. E. Killam	..do	4	3 04
2299	I. S. Raymond	..do	4	3 95
2300	S. E. Newell	..do	4	1 78
2301	W. C. Gamble	..do	4	3 26
2302	A. B Hostetter	Expenses attending 19th Dist. Con.	4	3 02
2303	E. E. Chester	Expenses as director	4	4 85
2304	H. A. McKeene	Janitor service	4	10 00
	Total			$127 29

Approved May 24, 1902.

Warrant number.	To whom.	For what.	Fund number.	Amount.
2305	A. B. Hostetter	Salary for May, 1902	2	$125 00
2306	United States Express Co		1	2 05
2307	American Express Co		1	1 80
2308	Adams Express Co		1	5 68
2309	A. B. Hostetter	Postage secretary's office	4	3 00
2310	D. D. Emery	Expenses delegate 18th Dist Conf.	4	2 90
2311	H. M. Phillips	..do	4	2 54
2312	E. D. Herbert	..do	4	2 45
2313	D. C. Bushnell	..do	4	1 14
2314	F. D. Linn	..do	4	2 60
2315	Read Russell	..do	4	3 80
2316	C. A. Weatherby	..do	4	1 94
2317	A. B. Hostetter	..do	4	5 00
2318	H. A. Winter	Expenses delegate 16th Dist. Conf.	4	2 89
2319	Mrs. S. Noble King	Exp. Ill. Assn. Domestic Science	7	24 00
	Total			$186 20

Approved June 12, 1902.

2320	A. B. Hostetter	Salary for June, 1902	2	$125 00
2321	Mrs. S. Noble King	Illinois Assn. of Domestic Science	7	139 96
2322	J. H. Coolidge	Expenses as director and president	4	28 16
2323	Membership fee	A. Assn. Inst. Workers, per A. B. H.	4	5 00
2324	J. H. Coolidge	Exp. delegate A. Assn. I. W. Mtg.	4	84 29
2325	A. B. Hostetter	..do	4	83 20
2326	Phillips Bros	Cuts for annual report, V. 17, VII.	4	86 00
2327	Western Union Tel. Co	Telegraph	1	27
2328	United States Express Co	Expressage	1	1 20
2329	American Express Co	..do	1	1 25
2330	John Underfanger	Freight and drayage	1	50
2331	A. B. Hostetter	Postage secretary's office	1	10 03
2332	Edw. Hartmann Co	Printing, postage, etc	1	114 75
	Total			$679 81

Approved July 8, 1902.

2333	Whiteside Co. Farmers' Inst	S. R. Hall, treasurer	5	$68 71
	Total			$68 71

Approved July 8, 1902.

2334	Mrs. S. Noble King	Expenses Illinois A. D. S.	7	$68 50
2335	H. D. Hughes	Expenses as director Com. Mtg.	4	14 48
2336	Joseph Newman	..do	4	12 20
2337	A. B. Hostetter	Expenses attending Com. Mtg.	4	5 82
2338	Frank Simons	100 Vols. for libraries	3	60 00
2339	W. A. Henry	20 Vols. Feed and Feeding	3	25 00
2340	A. B. Hostetter	Salary for July, 1902	2	208 33
2341	John Underfanger	Drayage	1	50
2342	A. B. Hostetter	Postage, secretary's office	1	22 00
2343	Ameridan Express Co	Expressage	1	2 42
	Total			$409 25

Approved Sept. 4, 1902.

Warrant number.	To whom.	For what.	Fund number.	Amount.
2344	Pacific Express Co	Expressage..........................	....	$ 1 37
2345	United Express Co	..do	1	2 24
2346	W. U. Telegraph Co..........	....	1	27
2347	Edw. F. Hartmann Co.......	Printing	1	23 25
2348	John Underfanger...........	Drayage	1	60
2349	A. B. Hostetter	Postage, secretary's office..........	....	7 00
2350	Frank Simmons	320 volumes library books..........	3	229 96
2351	Springfield Trunk Co	10 library cases.....................	3	29 50
2352	Fred C. Goodnow...........	Expenses as director	3	24 57
2353	E. E. Chester	..do	....	4 00
	Total........................	....	....	$322 94

Approved Aug. 18, 1902.

2354	John Underfanger...........	Drayage	1	$ 0 70
2355	A. B. Hostetter	Postage, secretary's office..........	1	5 00
2356	American Express Co.......	Expressage..........................	1	1 59
2357	Adams Express Co..........	..do	1	1 54
2358	A. B. Hostetter	Salary for August, 1902	2	208 33
2359	Springfield Camera Co......	Photo of library......................	3	3 75
2360	Springfield Trunk Co	12 locks	3	1 25
2361	Enoch Paine	Binding 280 vols. Bulletins..........	3	38 25
2362	Edw. Grimes..................	Expenses as director	3	23 43
	Total........................	....	....	$283 84

Approved Sept. 4, 1902.

2363	United States Express Co...	Expressage..........................	1	$ 1 60
2364	A. B. Hostetter	Postage, secretary's office..........	1	8 00
2365	Smith Premier Typewriter Co.........................	New machine........................	1	47 75
2366	Phillips Bros..................	Cuts for Annual Report	1	21 00
2367	Edw. Hartmann Co..........	Printing, etc.........................	1	50 15
2368	A. B. Hostetter	Salary for September, 1902.........	2	208 33
2369	M. A. Rankin	Janitor service, July, Aug. and Sept	1	3 00
2370	J. H. Coolidge................	Expenses as director	4	52 09
2371	A. P. Grout....................	Expenses district conference......	4	29 10
2372	A. P. Grout....................	Expenses as director	4	20 65
2373	James Frake	Expenses as director	4	6 98
2374	Merrill K. Sweet.............	......do	4	10 88
2375	F. C. Goodnow	Expenses dist. conference..........	4	12 30
2376	F. C. Goodnow	Expenses as director................	4	13 25
2377	B. F. Wyman..................	......do	4	15 10
2378	E. Davenport..................	......do	4	7 76
2379	Joseph Newman	......do	4	12 85
2380	E. N. Cobb....................	......do	4	9 05
2381	Mrs. S. Noble King..........	Expenses Ill. Ass'n Dom. Science.	7	6 25
	Total........................	....	....	$529 99

Approved Oct. 9, 1902.

Warrant number.	To whom.	For what.	Fund number.	Amount.
2382	Pacific Express Company	Expressage	1	$ 4 18
2383	American Express Company	..do	1	1 90
2384	John Underfanger	Drayage	1	35
2385	A. B. Hostetter	Postage, secretary's office	1	7 15
2386	Coe Brothers	Office supplies	1	1 60
2387	Frank Simmons	250 Manilla envelopes	1	2 25
2388	A. B. Hostetter	Salary for October	2	208 33
2389	J. P. Mason	Expenses as director	4	12 95
2390	C. P. Reynolds	......do	4	17 50
2391	H. D. Hughes	......do	4	16 35
2392	E. E. Chester	......do	4	6 56
2393	Euclid N. Cobb	......do	4	6 84
2394	A. B. Hostetter	Expenses as supt. in field	8	6 82
	Total			$292 78

Approved Oct. 31, 1902.

2395	Clay Co. Farmers' Institute	C. D. Duff, treas., Clay City, Ill.	5	$74 49
2396	Schuyler Co. Farmers' Inst.	J. H. Whitson, treas., Rushville	5	73 57
2397	Bond Co. Farmers' Institute	F. Dressor, treasurer, Sorento	5	75 00
2398	Hamilton Co. Farmers' Inst.	R. H. Redfearn, treas., McLeansboro	5	75 00
2399	Mason Co. Farmers' Inst.	Miss K. Brown, treas., Manito	5	75 00
2400	Wayne Co. Farmers' Inst.	R. B. Young, treasurer, Fairfield	5	75 00
	Total			$448 06

Approved Oct. 31, 1902.

2401	Richland Co. Farmers' Inst.	Frank Britton, treasurer, Olney	5	$75 00
2402	Williamson Co. Farm'rs' Inst	A. M. Townsend, treasurer, Marion	5	73 03
2403	Franklin Co. Farmers' Inst.	D. H. Little, treasurer, Benton	5	59 75
2404	Pulaski Co. Farmers' Inst.	Jas. W. Dille, treasurer, Villa Ridge	5	75 00
2405	Saline Co. Farmers' Inst.	C. H. Burnett, treasurer, Eldorado	5	51 75
	Total			$334 53

Approved Nov. 12, 1902.

2406	Adams Express Co	Expressage	1	$ 6 55
2407	American Express Co	..do	1	4 10
2408	United States Express Co	..do	1	2 45
2409	A. B. Hostetter	Postage for Vol. 7	1	30 00
2410	A. B. Hostetter	Expenses field work	8	11 27
2411	J. H. Coolidge	Expenses as director	4	33 25
	Total			$87 62

Approved Nov. 12, 1902.

2412	E. W. Burroughs	Expenses as director	4	$49 10
2413	E. N. Cobb	..do	4	5 50
2414	F. I. Mann	..do	4	18 08
2415	B. F. Wyman	..do	4	15 85
2416	H. G. Easterly	..do	4	45 25
2417	James Frake	..do	4	6 45
2418	J. H. Coolidge	..do	4	17 00
2419	Springfield Trunk Co	10 library cases	8	30 00
2420	Frank Simmons	310 Vols. for libraries	3	228 20
	Total			$415 53

Approved Nov. 19, 1902.

Warrant number	To whom.	For what.	Fund number.	Amonet.
2421	Edwards Co, Farmers' Inst.	M. E. Shurtleff, Treas., Bone Gap.	5	$75 00
2422	Jackson Co. Farmers' Inst..	J. L. Miller, Treas., Murphysboro.	5	75 00
2423	25th District Farmers' Inst.	..do	6	50 00
2424	Hardin Co. Farmers' Inst...	Ed Schneider, Treas., Saline Mines	5	75 00
2425	Marion Co. Farmers' Inst...	T. S. Marshall, Treas., Salem......	5	75 00
2426	Clinton Co. Farmers' Inst..	J. B. Heunuer, treasurer, Albers Station	5	51 45
2427	Gallatin Co. Farmars' Inst.	A. Winterberger. treas., Junction,.	5	58 49
2428	Madison Co. Farmers' Inst..	L. S. Dorsey, treas., Moro..........	5	75 00
	Total			$534 94

Approved Nov. 19, 1902.

2429	Alexander Co. Farmers' Inst	Wiley Clutts, treas., Thebes	5	$73 50
2430	Christian Co. Farmers' Inst.	E. A. Vandeveer, treas., Taylorville	5	75 00
2431	Crawford Co. Farmers' Inst.	S. F. Reinoehl, treas., New Hebron	5	51 45
2432	Fulton Co. Farmers' Inst....	Geo. Shawver, treas., Lewiston....	5	75 00
2433	Jasper Co. Farmers' Inst....	W. H. Kibler, treas., Newton.......	5	75 00
2434	Jefferson Co. Farmers' Inst.	T. J. Holstlaw, treas., Mt. Vernon.	5	73 41
2435	Jersey Co. Farmers' Instit'te	Jos. R. Fulkersom, treas., Jerseyville	5	75 00
2436	Morgan Co. Farmers' Inst..	H. G. Keplinger, treas., Sparta....	5	75 00
2437	Randolph Co. Farmers' Inst.	W. M. Beattie, treas., Sparta.......	5	75 00
2438	Sangamon Co. Farmers' Inst	L. H. Coleman, treas., Springfield.	5	75 00
2439	Scott Co. Farmers' Institute	T. J. Priest, treas., Winchester....	5	75 00
2440	20th Dist. Institute...........	T. J. Priest, treas., Winchester....	6	47 90
2441	Union Co. Farmers' Insti ...	H. C. George, treas., Anna.........	5	64 45
	Total			$910 71

Approved Dec. 4, 1902.

2442	Adams Express Company...	Expressage on reports..............	1	$ 68 75
2443	John Underfanger...........	Drayage..................................	1	70
2444	Edw. Hartmann Co..........	Printing programs. etc.............	1	130 00
2445	A. B. Hostetter........... ...	Salary for November...............	2	208 33
2446	Henry F. Thurston..........	10 vols. for library	3	5 35
2447	A. B. Hostetter...............	Exp. com. meeting. Bloomington..	4	7 87
2448	A. B. Hostetter...............	Expenses field work................	8	10 87
	Total			$431 87

Approved Dec. 4, 1902.

2449	American Express Co..........	Expressage.............................	1	$ 67 59
2450	Pacific Express Co.............	.. do......................................	1	41 70
2451	United States Express Co...	.. do......................................	1	26 53
2452	Springfield Trunk Co..........	10 library cases......................	3	30 00
2453	Frank Simmons.................	427 vols. library books............	3	306 06
2454	S. Noble King..................	Expenses as director...............	4	17 50
2455	Frank H. Hall..................	Services as speaker................	4	30 00
2456	Ralph Allen......................	Expenses as director...............	4	14 38
2457	Ralph Allen......................	.. do......................................	4	14 85
2458	Mrs. S. Noble King............	Expenses Ill. Ass'n Dom. Science..	7	27 00
2459	A. B. Hostetter.................	Expenres, field work................	8	31 76
	Total			$607 37

Approved Dec. 23, 1902.

Warrant number.	To whom.	For what.	Fund number.	Amount.
2460	Calhoum Co. Farmers' Inst.	Geo. L. Aderton, treas., Harding...	5	$45 83
2461	Fayette Co. Farmers' Inst...	R. T. Higgins, treas., Vandalia....	5	75 00
2462	Greene Co. Farmers' Inst...	T. J. Rafferty, treas., Carrollton...	5	59 60
2463	Lawrence Co. Farmers' Inst.	J. E. Dollahan, treas., Birds	5	75 00
2464	23rd District Farmers' Inst..	J. E. Dollahan, treas., Birds	6	44 21
2465	Macoupin Co. Farmers' Inst.	L. B. Corban, treas., Carlinville....	5	75 00
2466	Menard Co Farmers' Inst...	Wm. Young, treas., Athens........	5	75 00
2467	Montgomery Co. Farmers' Institute....................	Edw. Grimes, treas., Raymond	5	75 00
2468	21st District Farmers' Inst..	Edw. Grimes, treas., Raymond	6	50 00
2469	Tazwell Co. Farmers' Inst..	Thos. Viemont, treas., Mackinaw..	5	75 00
2470	Wabash Co. Farmers' Inst..	E. C. Deputy, treas., Maud.........	5	75 00
	Total....................	....	....	$724 64

Approved Dec. 23, 1902.

2471	DeKalb Co. Farmers' Inst...	B. F. Wyman, treas., Sycamore....	5	$75 00
2472	12th District Farmers' Inst..	B. F. Wyman, treas., Sycamore....	6	50 00
2473	Coles Co. Farmers' Inst.....	H. F. Hill, treas., Charleston...... .	5	75 05
2474	Cumberland Co. Farmers' Institute....................	A. H. Yanaway, treas., Toledo.....	5	46 50
2475	Douglas Co. Farmers' Inst..	W. S. Read, treas., Arcola..........	5	75 00
2476	Henderson Co. Farmers Inst	Carl Beal, treas., Reed..............	5	55 25
2477	McDonough Co. Farm. Inst.	H. A. Knight, treas., Macomb.......	5	62 25
2478	Mercer Co. Farmers' Inst...	Paul Ketsel, treas. Reynolds.......	5	74 25
2479	Stark Co. Farmers' Inst.....	Irwin Dolan, treas., Toulon	5	75 00
2480	16th Cong. Dist. Farm. Inst.	..do	6	9 05
2481	Pope Co. Farmers' Inst	Geo. Hacker, treas.. Golconda	5	57 25
2482	Warren Co. Farmers' Inst ..	Thos. McClanahan, treas., Monm'th	5	66 65
2483	Woodford Co. Farmers' Inst	H. Kauffman, treas., Cruger.......	5	33 05
	Total....................	....	....	$779 74

Approved Dec. 29, 1902.

2484	**A. B. Hostetter ....**	**Trip to Bloomington, printing.....**	**1**	**$ 4 72**
2485	**A. B. Hostetter ....**	**Salary for December, 1902 ....**	**2**	**208 33**
2486	**Mrs. S. Noble King...........**	**Expenses Ill. Ass'n Dom. Science..**	**7**	**22 75**
2487	**Frank H. Hall.................**	**Services as speaker, two institutes**	**4**	**20 00**
	Total.....................	....	....	**$255 80**

Approved Dec. 29, 1902.

2488	American Exress Co	Expressage..............................	1	$24 40
2489	Adams Express Co	..do	1	33 27
2490	Pacific Express Co	..do	1	4 50
2491	United States Express Co ..	..do	1	14 90
2492	Western Union Tel. Co......	Telegram................................	1	25
2493	M. A. Rankin.................	Services as janitor, care of room...	1	3 00
2494	A. W. Mumford..............	30 vols. library books................	3	29 00
2495	Brown Co. Farmers' Inst ...	R. Bloomfield, treas., Mt. Sterling.	5	46 78
2496	Monroe Co. Farmers' Inst...	W. H. Limestall, treas., Renault...	5	75 00
2497	22d Dist. Farmers' Inst......	..do	6	50 00
2498	Perry County Farmers Inst.	W. T. White, treas., Coulter.........	5	75 00
2499	Putnam Co. Farmers' Inst..	Amos. B. Wilson, treas., McNabb..	5	75 00
2500	Washington Co. Farm. Inst.	E. P. Seibert, treas., Ashley........	5	75 00
2501	White Co. Farmers' Inst	Daniel Berry, treas., Carmi, Ill.....	5	75 00
2502	24th Dist. Farmers' Inst.....	..do	6	50 00
	Total....................	....	....	$621 78

Approved Jan. 7, 1902.

Warrant number.	To whom.	For what.	Fund number.	Amount.
2603	Edw. F. Hartmann Co	Printing, postage, etc	1	$ 32 50
2604	Pantagraph Printing Co	7,000 programs	1	143 00
2605	John Underfanger	Drayage and freight	1	2 50
2606	A. B. Hostetter	Postage for reports, etc	1	26 00
2607	Frank Simmons	160 vols. library books	3	101 50
2608	Calhoun Co. Farmers' Inst.	G. W. Long, Hillcrest	4	20 00
2609	Walter P. Kimzey	Soils com. expenses	4	14 43
2610	B. F. Wyman	Expenses as director, board meet'g	4	19 40
2611	F. C. Rossiter	..do	4	9 80
2612	J. H. Coolidge	..do	4	69 09
2613	A. F. Moore	..do	4	16 54
2614	Joseph Newman	..do	4	15 35
2615	Ralph Allen	..do	4	10 18
2616	A. P. Grout	..do	4	6 15
2617	James Frake	..do	4	7 95
2618	E. W. Burroughs	..do	4	24 51
2619	H. A. Aldrich	..do	4	9 37
2620	H. D. Hughes	..do	4	19 43
2621	E. N. Cobb	..do	4	14 29
2622	Israel Mills	..do	4	9 66
2623	Merrill K. Sweet	..do	4	13 82
2624	F. I. Mann	..do	4	9 20
2625	Henry Co. Farmers' Inst.	J. B. Hanlon, treas., Galva	5	75 00
2626	15th Dist. Farmers' Inst.	..do	5	50 00
2627	Knox Co. Farmers' Inst.	C. N. Butt, treas., Knoxville	5	75 00
2628	Piatt Co. Farmers' Inst.	W. W. Boyer, treas., Monticello	5	75 00
2629	Pike Co. Farmers' Inst.	C. M. Simmons, treas., Griggsville.	5	75 00
2630	St. Clair Co. Farmers' Inst.	E. J. Herter, treasurer, Mascoutah	5	75 00
	Total			$1,088 74

Approved Jan. 15, 1903.

2531	Bureau Co. Farmers' Inst.	E. P. Lovejoy, treas., Princeton	5	$75 00
2532	Effingham Co. Farmers' Inst	W. J. Judkins, treas., Shumway	5	75 00
2533	Ford Co. Farmers' Institute	D. A. Taylor, treas., Gibson City	5	75 00
2534	Hancock Co. Farmers' Inst.	W. H. Moore, treas., Carthage	5	75 00
2535	14th Cong.Dist.Farm'rs' Inst	..do	6	50 00
2536	Johnson Co. Farmers' Inst.	Ira J. Dunlap, treas., Ozark	5	67 09
2537	Lee Co. Farmers' Institute.	J. L. Hartwell, treas., Dixon	5	75 00
2538	Marshall Co. Farmers' Inst.	Mitchell Miller, treas., Lacon	5	75 00
2539	McLean Co. Farmers' Inst.	C. C. Wagner, treas., Bloomington	5	75 00
2540	Ogle Co. Farmers' Institute.	Frank D. Linn, treas., Byron	5	75 00
2541	Rock Island Co.Farm'rs' Inst	W. H. Ashdown, treas., Port Byron	5	63 05
2542	Clark Co. Farmers' Institute	J. W. Adams, treas., Marshall	5	75 00
2543	18th District Farmers' Inst.	..do	6	50 00
2544	DeWitt Co. Farmers' Inst.	S. E. Newell, treas., Clinton	5	75 00
2545	19th District Farmers' Inst.	..do	6	50 00
2546	Iroquois Co. Farmers' Inst.	H. C. Center, treas., Watseka	5	75 00
2547	Massac Co. Farmers' Inst.	J. T. McCartney, treas., Metropolis	5	60 81
2548	Stephenson Co.Farm'rs' Inst	F. B. Walker, treas., Cedarville	5	75 00
2549	13th District Farmers' Inst.	..do	6	50 00
2550	Vermilion Co. Farmers' Inst	M. J. Wolford, treas., Danville	5	75 00
2551	Kendall Co. Farmers' Inst.	A. C. Gabel, treas., Yorkville	5	75 00
	Total			$1,440 95

Warrant number.	To whom.	For what.	Fund number.	Amount.
2552	American Express Co	Expressage	5	$ 8 05
2553	Adams Express Co	..do	1	12 59
2554	John Underfanger	Drayage and freight	1	1 68
2555	A. B. Hostetter	Salary for January, 1903	2	208 33
2556	Springfield Trunk Co	10 library cases	3	30 00
2557	American Library Ass'n	Dues	3	4 00
2558	S. Noble King	Expenses as director	4	4 35
2559	Illinois State Library Ass'n.	Dues	3	1 00
2560	S. Noble King	Expenses as director	4	6 85
2561	Fred C. Goodnow	..do	4	22 29
2562	A. B. Hostetter	Expenses, field work	8	24 55
	Total			$324 80

Approved Feb. 11, 1903.

2563	The Pacific Express Co	Expressage	1	$ 1 95
2564	United States Express Co	..do	1	2 80
2565	W. Union Telegraph Co	Messages	1	1 14
2566	Frank H. Hall	Services as speaker	4	50 00
2567	H. G. Easterly	Expenses as director	4	14 75
2568	Edw. F. Hartmann Co	Printing, etc	1	21 00
2569	A. B. Hostetter	Postage, secretary's office	1	5 40
2570	M. A. Rankin	Janitor services	1	3 00
2571	Frank Simmons	Twenty volumes library books	3	6 00
2572	F. I. Mann	Expenses as director	4	7 35
	Total			$113 39

2573	Cook Co. Farmers' Inst	F. C. Rossiter, treasurer, Chicago	5	$75 09
2574	7th Dist. Farmers' Inst	..do	6	20 50
2575	Kankakee Co. Farmers' Inst.	L. W. Smith, treasurer, Manteno	5	75 00
2576	Champ'gn Co. Farmers' Inst.	Z. R. Genung, treasurer, Rantoul	5	75 00
	Total			$245 59

Approved Feb. 11, 1903.

2577	A. B. Hostetter	Postage and office supplies	1	$ 4 20
2578	Springfield Trunk Co	Ten library cases	3	30 00
2579	Edward Grimes	Expenses as director	4	31 87
2580	J. H. Coolidge	..do	4	44 95
2581	Ralph Allen	..do	4	7 82
2582	A. C. McClurg Co	290 volumes library books	3	226 33
2583	E. E. Chester	Expenses as director	4	43 77
2584	Frank H. Hall	Services as speaker	4	30 00
2585	Paine & Barnes	Printing 536 badges	1	16 00
	Total			$433 90

Warrant number.	To whom.	For what.	Fund number.	Amount.
2526	McHenry Co. Farmers' Inst.	F. C. Wells, treas., Harvard........	5	$75 00
2587	11th Dist, Farmers' Inst......	..do	6	50 00
2588	Peoria Co. Farmers' Inst....	Ira Cottingham, treas., Eden	5	75 00
2589	Carroll Co. Farmers' Inst...	John Simpson treas., Mt. Carroll..	5	75 00
2590	Winnebago Co. Farmers' In.	Thern Pierpont, treas., Rockford..	5	75 00
2591	Kane Co. Farmers' Inst......	E. S. Bowdist, treas., Elburn	5	75 00
2592	Macon Co. Farmers' Inst....	C. H. Scott, treas., Mt. Vernon.....	5	75 00
2593	Moultrie Co. Farmers' Inst.	W. R. Bane, treas., Bethany........	5	75 00
	Total	....	....	$575 00

2594	Mrs. Ada F. Howie, Elm Grove, Wis	For State Institute..................	4	$24 00
2595	Geo. McKerrow, Sussex, Wis.	..do	4	15 46
2596	Mrs. N. Kedzie Jones, Borea, Ky	..do	4	70 39
2597	Oscar Erf, Urbana	..do	4	6 45
2598	Frank H. Hall, Aurora......	..do	4	6 29
2599	A. D. Shamel, Washington, D. C........................	..do	4	58 50
2600	U. P. Hedrick, Agricultural College, Michigan.........	..do	4	30 75
2601	W. J. Fraser, Urbana	..do	4	2 26
2602	Henry Wallace, Des Moines, Ia	..do	4	26 70
2603	Chas. E. Thorne, Wooster, O..........................	..do	4	18 40
2604	J. C. Blair, Urbana..........	..do	4	13 29
2605	Chas. P. Henderson, Chicago	..do	4	6 85
2606	H. W. Mumford, Urbana....	..do	4	5 30
2607	R. B. Mumford, Columbia, Mo	..do	4	20 27
2608	A. J. Glover, Elgin	..do	4	6 85
2609	C. G. Hopkins, Urbana......	..do	4	2 10
2610	Rosa Ostertag, Urbana......	Stenographer service...............	4	15 00
2611	Emeret S. Hardy, Bloomington	Typewriting	4	4 00
2612	J. E. Burke, Bloomington...	Printing	1	5 00
2613	J. C. Coblentz...............	Stamps and covers...................	1	2 43
2614	Pantagraph Printing Co., Bloomington	Printing	1	10 50
2615	Illinois Hotel, Bloomington.	Board of speakers...................	4	108 00
2616	.. do	..do	4	8 25
2617	P. G. Holden, Ames, Ia	Speaker State Institute	4	33 12
2618	S. Noble King................	Expenses as director	4	6 97
2619	Merrill K. Sweet.............	..do	4	17 26
2620	F. C. Goodnow	..do	4	14 45
2621	E. N. Cobb..................	..do	4	14 55
2622	H. D. Hughes................	..do	4	18 46
2623	Joseph Carter................	Speaker Illinois Assn. D. S........	7	3 90
2624	Mrs. Joseph Carter..........	..do	7	10 59
2625	Mrs. S. Noble King..........	..do	7	8 00
2626	A. B. Hostetter	Postage secretary's office	1	6 00
2627	.. do	Expenses State Institute...........	4	4 65
	Total..........................	....	....	$600 03

Approved Feb. 2, 1903.

S. NOBLE KING, *Auditor.*

On motion of Director Hughes the report of the secretary was approved and the financial statement included in same referred to the Finance Committee.

INSTITUTE ROOM, March 3, 1903.

To the Board of Directors of the Illinois Farmers' Institute:

GENTLEMEN—It becomes my duty as well as pleasure to report to you in regard to the condition of the institute work for the past year. The general progress of the work was fully covered in my report to the farmers' institute at Bloomington, but I will ask the privilege of calling your attention to some of the details and of making a few recommendations in regard to what might be done the coming year.

Section 3, article V, of your by-laws provides that the superintendent shall visit county institutes and district conferences when invited to do so by the county institute officers or directors, or when in his judgment the institute work demands such visit.

Under this provision I visited three of the district conferences on the invitation of the directors and 14 county institutes on the invitation of the county officers. It was not generally understood by county institute officers that the superintendent would attend county institutes, so not very many invitations were received although there were several that I could not attend on account of conflicting dates. The cost of visiting the 14 institutes was $85.27, being mostly for railroad fares, the county institute entertaining me in most cases.

As the institutes I visited have invited me to come again and the advantages of personal contact with the institute officers and the institute work are so many, both for the county institute and for the efficiency of the superintendent's work, I recommend that $300 be again appropriated for the expenses of the superintendent for field work.

The district institute meetings as a rule are no better than the regular county meetings and the extra $50 allowed for district meetings simply takes the place of local funds which might otherwise be contributed by the local people to the great advantage of the institute in creating local interest and local enthusiasm. There are advantages to be derived from a district meeting by having delegates in attendance from other counties than the one in which the meeting occurs.

The attendance of such delegates creates a wholesome rivalry in institute management and success and gives an opportunity for comparison of methods and improvement in programs and exhibits, and the management of same. I recommend that the usual appropriation be made for district institutes (namely, $50) and that it be used in paying the expenses of the best speakers available from the counties in the district, who may be put upon the program and who will represent said counties at the district institute and make report of such visit to the home county institute.

In response to a request for the presidents of the county institutes to report upon the character and work of the institute speakers and the results obtained from institute instruction 64 presidents reported. These reports show that the speakers gave almost universal satisfaction, and that many counties were realizing practical results from the institute teachings.

In response to a similar request for information in regard to speakers from the directors from this board only five reported. Three of these reported for one county only, one reported upon two counties and one upon three counties.

From this we must conclude that our speakers are doing good work, are satisfactory to the directors and to the institutes.

While these reports or lack of reports are encouraging still I believe that there is much room for improvement in our institute instructors.

Too much credit is given to the speakers who entertain. There is more need of specific instruction.

We have done more to encourage improvement in corn than on any other line because the instruction in regard to the selection of corn for seed and for exhibition has been upon well defined, specific lines. I believe that a conference of institute workers for the purpose of comparing experiences and methods of presenting subjects to farmers' institute audiences would be of great value in increasing the efficiency of institute instructors.

An institute speaker to obtain the best results should be so familiar with his subject and so full of practical suggestions in regard to it that he can talk without a set paper and be able to adapt his remarks in each instance to the special needs of his hearers.

I recommend the holding of such conference of speakers in connection with the next meeting of the board of directors and that the expenses of the speakers invited to attend such conference be paid from the general fund of the institute.

There is no question which concerns the people of the whole State so much as that of soil fertility, I recommend therefore that it be made the subject for consideration at all the institutes and an effort be made to secure competent speakers to present the same.

The bulletin we have been issuing each year, containing a list of speakers, suggestions upon the make up of programs, the names of county institute officers, and notice of how to secure free scholarships and free libraries, has proved a great help and convenience to county institute officers. I recommend the publication at an early date of another bulletin upon the same basis.

The employment of Mr. Frank H. Hall to attend institute meetings I am confident gave satisfaction to all parties who were enabled to secure his services. The reception given him by the county institute officers was such that I feel justified in recommending that his services be secured for the coming season and the terms to the county institutes advertised in the bulletin.

I believe that the plan of employing competent institute instructors and dividing the cost of their service with the county institutes is worthy of extension, to at least two more instructors, for the coming season.

Respectfully submitted,

A. B. HOSTETTER,
Superintendent of Institutes.

On motion the report of the superintendent was accepted and ordered placed upon file.

Mr. E. E. Chester, chairman of the committee on legislation, reported a bill for the amendment of the act creating the Illinois Farmers' Institute, which would provide for the payment of officers.

Mr. Grout moved that the board go into executive session for the consideration of such amendment before the report was received or acted upon.

Motion adopted and the board went into executive session.

The board being again called in regular session Mr. Grout reported as the result of the executive session the following bill for an amendment to the act creating the Illinois Farmers' Institute:

A bill for an act to amend section 6 of "An act creating the Illinois Farmers' Institute," approved June 24, 1895:

SECTION 1. Be it enacted by the People of the State of Illinois, represented in the General Assembly: That section 6 of "An act creating the Illinois Farmers' Institute," approved June 24, 1895, be amended to read as follows:

Section 6. The members of each new board of directors shall enter upon their duties the second Tuesday after their election and hold their offices for one year or two years, as provided in section 3, or until their successors are elected and enter upon their duties The board of directors shall have power to fill vacancies in the board. It shall be organized by the election of a president, vice president, treasurer and secretary, who shall hold their offices for one year, their term of office to begin July 1st following their election. It shall employ such superintendents, speakers and clerks as may be deemed proper for organizing and conducting the work of the Illinois Farmers' Institute, and provide for their compensation by the rules of the board of directors. The secretary and treasurer may be other than members of the board of directors. The salary of the secretary shall be two thousand dollars ($2,000) a year, payable in monthly installments.

On motion the bill, as reported by the committee, was adopted.

On motion the board adjourned.

Minutes read and approved June 4, 1903, by the executive committee.

A. B. HOSTETTER,
Secretary.

J. H. COOLIDGE,
President.

ANNUAL REPORT OF COUNTY FARMERS' INSTITUTES FOR THE YEAR FROM JULY, 1902 TO JULY, 1903.

Adams County—Institute held at Liberty Oct. 16 and 17, 1902; average daily attendance, 350; cost, $75,00. Officers elected for the ensuing year: President, E. L. Grosh, Mendon; secretary and treasurer, J. E. Simmonds, Camp Point.

Alexander County—Institute held at Thebes Nov. 7 and 8, 1902; average daily attendance, 100; cost, $73.50. Officers elected for the ensuing year: President, Cyrille A. Marchildon, Thebes; secretary, Leslie C. Atherton, Grove Island; treasurer, Wiley Clutts, Thebes.

Bond County—Institute held at Sorento Oct. 14 and 15, 1902; average daily attendance, 250; cost, $76.14. Officers elected for the ensuing year: President, I. H. Denny, Sorento; secretary, Rufus Cruthis, Sorento; treasurer, F. Dressor, Sorento.

Boone County—Institute held at Belvidere Feb. 4, 5 and 6, 1903; average daily attendance, 400; cost, $93.24. Officers elected for the ensuing year: President, B. S. Herbert, Belvidere; secretary, Walter Lucas, Belvidere; treasurer, Luther Lawrence, Belvidere.

Brown County—Institute held at Mt. Sterling Dec. 10 and 11, 1902; average daily attendance, 250; cost, $46.73. Officers elected for the ensuing year: President, W. B. Rigg, Mt. Sterling; secretary, Robert Means, Hersman; treasurer, Robert Bloomfield, Mt. Sterling.

Bureau County—Institutue held at Sheffield Dec. 16 and 17, 1902: average daily attendance, 475; cost, $135.79. Officers elected for the ensuing year: President, L. K. Bryant, Princeton; secretary, Guy A. Bryant, Princeton; treasurer, E. P. Lovejoy, Princeton.

Calhoun County—Institute held at Hardin Nov. 6 and 7, 1902; average daily attendance, 150; cost, $45.83. Officers elected for the ensuing year: President, Geo. W. Long, Hillcrest; secretary, Charles Temple, Hardin; treasurer, Geo. L. Aderton, Hardin.

Carroll County—Institute held at Milledgeville Jan. 14 and 15, 1903; average daily attendance, 300; cost, $98.66. Officers elected for the ensuing year: President, D. S. Mackay, Mount Carroll; secretary, W. R. Hostetter, Mount Carroll; treasurer, John Simpson, Mount Carroll.

Cass County—Institute held at Virginia Dec. 10, 11 and 12, 1903; average daily attendance, 75; cost, $88.42. Officers elected for the ensuing year: President, Charles Beggs, Ashland; secretary and treasurer, J. E. Edwards, Ashland,

Champaign County—Champaign county held two institutes, one Sept. 23 and 24, 1902, at Philo—an out-door contest of farm implements; out-door attendance, 800; in-door attendance, 300; cost, $43.10; the second meeting at Fisher Jan. 13-14, 1903; average daily attendance, 250; cost, $85.67. Officers elected for the ensuing year: President, I. S. Raymond, Philo; secretary, J. A. Hossack, Savoy; treasurer, Z. R. Genung, Rantoul.

The farmers of Champaign county, Illinois, departed from their usual routine in the holding of their institute this year, and the result was a decided success. The feature of the institute was the holding of a plowing match, the first of the kind ever held in the county. Exhibits were also made of other farm machinery, and some kinds were put to the test. One test that should be noted was that of manure spreaders. The Smith, Miller and Kemp spreaders took part in the contest, and the committee reported that there was little to choose between them, and that in their opinion they were just the machines for any neighborhood to club together and own. A thorough test was given them with well-rotted manure, fresh from the stable and straw-stack trimmings, and the work was entirely satisfactory to the crowd of farmers present, the spreading being done so much more evenly than could be done by hand.

The following table gives the results of the draft tests made on the various plows in the contest:

Number of Test.	Size of Furrow.		Area of cross section.	Total draft of ploy.	Draft per square inch.	Remarks.
	Width.	Depth.				
1	15.8	6.08	96.06	535.0	5.56	All in 16-in. sulkies.
2	16.35	6.37	104.14	587.5	5.64	.. do
3	15.54	7.29	113.29	505.0	4.45	.. do
4	-17.32	6.37	110.31	597.5	5.41	.. do
Averages	16.04	6.52	105.91	556.2	5.26	
5	26.29	6.57	181.290	700.0	3.80	2 14-in. gangs
6	29.40	6.208	176.307	705.0	3.39	.. do
Averages	27.395	6.539	178.803	702.0	3.395	

Soil—Black prairie, oat stubble and very trashy.

Plows tested were Oliver Chilled, XX Rays, Defiance, Diamond, Cassady and Success. These names are not in the order of the test made, as the committee did not wish to make them public. One quite noticeable feature of the above table is the much lighter relative draft of the gang plows as compared with the single sulkies. This is in harmony with other similar tests. Disc plows were also tested. The remarks of the committee on the above tests were as follows:

These tests are not final by any means, but may be taken as a fair average of the draft of plows. All the plows tested are inside of the pull, which might in reason be expected. A plow may pull with less draft and yet the kind of work done would not be so good as that of the plow giving the greatest draft. It has been estimated that 35 per cent of the draft is due to friction of the earth on the bottom and sides of the plow, 55 per cent of the draft is expended in cutting and pulverizing the furrow slice, 10 per cent of the draft is expended in turning the furrow. A farmer would prefer a plow which pulverizes the soil, and a slight difference in draft is not to be considered.

Question: What draft should a horse be allowed to exert?

Answer: The greatest pull which a horse exert will not exceed one-half his weight; and a horse will be doing all that should be expected of him when he exerts a pull equal to one-eighth of his weight at a traveling rate of two and one-half to three miles per hour; this would mean two and three-quarters to three acres per day with a sixteen-inch sulky plow.

Question: What should be said regarding the disc plow?

Answer: On fairly clean corn stubble ground or clean oat stubble the disc plow will equal the pulverizing done by the mold-board plow, and it leaves the ground in a satisfactory condition. The disc plow pulls with a lighter draft than the mold-board plow under all conditions. Sod ground or very trashy ground will not be satisfactorily worked by a disc plow. A disc plow has a place on a farm o' 100 acres or over; but no farmer can satisfactorily do the work with it at all times and under all conditions that he can with the mold-board plow.

In the plowing match contestants were each required to plow one acre—plots were measured off with spaces left between. As each plowman had to finish his own land with a dead furrow, he had first to start by plowing around the plot. This was equal to starting two lands, and was considered a good test of skill—score named 20 points for this. You will notice from the report that the work done graded high with one exception.

Eaveness of furrow meant—in width and depth—with uniform pitch of the soil.

Finish and full furrow 30 points. The aim of each plowman was to finish the land with an equal number of furrows on either side of the dead furrow—in this we see the widest range of figures. Soil was black prairie oat stubble with a very heavy growth of weeds and clover. The work done by each contestant was much better than the average plowing done on our farms, and those in attendance learned from the farmers' institute that there is always an advantage in painstaking work.

Possibly you gentlemen of the State institute may not approve of an outdoor meeting of this kind—should this be the case you had better let us know as we have been sharpening our ideas to try! try! try! again. However, hoping it will meet with your approval.

J. A. Hossack,
Secretary.

Christian County—Institute held at Morrisonville Oct. 15, 16 and 17, 1902; average daily attendance, 450; cost, $84.51. Officers elected for the ensuing year: President, William Lowis, Morrisonville; secretary, Fred Grundy. Morrisonville; treasurer, E. A. Vandereer, Taylorville.

Report of delegate to the State institute: The Sixteenth Annual Farmers' Institute of Christian county, was held in Morrisonville, Oct. 15, 16 and 17, and through liberal and skillful advertising and a first-class program it proved to be the largest and best ever held in the county. One fine feature of this institute was the attendance of over 60 teachers and school officers and nearly 400 pupils of our public schools at the first session to hear the address of Hon. Alfred Bayliss, State superintendent of public instruction, on "Some Things Which Would Benefit Our Country Schools." Another excellent feature was a large exhibit of the work of the pupils of the rural schools in the county. This exhibit proved quite an attraction and received much favorable comment.

We had a splendid exhibit of farm and garden products, especially of corn, some of which equalled the best shown at the State Fair. The premiums offered for these exhibits were valuable and competition was keen. The 20 ears of corn that won the Ohio corn cultivator brought at auction $2.64. The exhibit of farm products did not interfere with the attendance at the institute but rather increased it, as the exhibit room was closed during the sessions and everybody went to hear the speaking. Our average attendance at the day sessions was 450 and at the night sessions over 1,000 and many were unable to get into the hall.

The domestic science assoication conducted two sessions of the first day—afternoon and evening, at which an excellent program was carried out.

Our speakers were among the best informed in the State and the large and attentive audiences inspired them to give us the very best they had. They gave our people pointers that will prove worth many a good dollar to them. Christian county is forging ahead. Last fall we sent a delegation of 304 of the best of the teachers and pupils of our public schools, with a good sprinkling of our most wide-awake farmers and their wives, to Champaign in charge of Miss Anna Barbre, county superintendent of schools, to inspect the college of agriculture and the workings of the experiment station. It is safe to say that the people of Christian county now know more about what those excellent institutions are doing for the farmers of the State than the people of any other county an equal distance from Champaign.

One of the secrets of securing a good institute is thorough advertising. Present a list of subjects that touch the pockets of the farmers in the county, with a list of speakers who thoroughly understand those subjects, then advertise until everybody is talking institute.

WM. LOWIS,
County President.

Morrisonville, Ill.

Clark County—Institute was held in connection with the district meeting at Marshall Jan. 21, 22 and 23, 1903; average daily attendance, 200; cost, $125.71. Officers elected for the ensuing year: President, Charles Thornburg, Marshall; secretary, J. A. Sweet, Marshall; treasurer, J. W. Adams, Marshall.

Clay County—Institute held at Clay City Oct. 14, 15 and 16, 1903; average daily attendanace 700; cost, $74.49. Officers elected for the ensuing year: President, Israel Mills, Clay City; secretary and treasurer, C. D. Duff, Clay City.

Report of delegates to State institute.

We held three meetings each day presided over by Israel Mills, president. The first day of the institute we had an able address from Prof. Samuel Harwood, of Carbondale, and the balance of the session was devoted to the discussion of the various farm topics by our own county farmers.

On the second and third days of the institute Mr. John T. Galbrieth, of Carlinville, gave us excellent addresses and the various problems of profitable farming were discussed by our own county farmers.

The afternoon of the second day session was devoted to domestic science. At this session able addresses were made by Mrs. J. J. Southworth of Danville, and Mrs. Helen Coffer of Charleston.

During the institute we had an exhibit of all the various farm products and for each of these we gave small prize, which was contributed by the citizens of the town.

Each day of the institute was well attended by farmers from different parts of the county and we feel that much good will result from each meeting of the institute. One of the noticeable features of the institute is that the most thrifty and progressive farmers in the county are the ones that take the greatest interest in these meetings and give them their encouragement.

C. D. DUFF,
Secretary Clay County Farmers' Institute.

Clinton County—Institute held at Breese Nov. 7 and 8, 1902; average daily attendance, 60; cost, $51.45. Officers elected for the ensuing year: President, W. J. Hoffsommers, Breese; secretary, George Nettemeyrs, Albers Station; treasurer, J. B. Heiman, Albers Station.

Coles County—Institute held at Charleston Dec. 2, 3 and 4, 1902; average daily attendance, 50, cost, $96.95. Officers elected for the ensuing year: President, J. O. Toland, Humbolt; secretary and treasurer, H. F. Hill, Charleston.

Cook County—Institute held at Arlington Heights Jan. 30 and 31, 1903; average daily attendance, 134; cost, $95.59. Officers elected for the ensuing year: President, C. P. Renolds, Drovers' Journal, Chicago; secretary, F. C. Rossiter, 91 Washington street, Chicago; treasurer, ———, Chicago.

Crawford County—Institute held at Robinson Nov. 20 and 21, 1903; average daily attendance, 250; Cost, $51.45. Officers elected for the ensuing year: President, J. M. Hollingsworth, Trimble; secretary, A. T. Trimble, Trimble; treasurer, Sanford S. Reinoehl, New Hebron.

Cumberland County—Institute held at Toledo Dec. 10 and 11, 1902; average daily attendance, 200; cost, $46.50. President, P. T. Bowman, Greenup; secretary and treasurer, A. H. Yanaway, Toledo.

DeKalb County—Institute held at Kingston with the 12th district institute, Dec. 17, 18 and 19, 1902; average daily attendance, 400: cost, $198.77. Officers elected for the ensuing year: President, H. O. Whitmore, Sycamore; secretary and treasurer, B. F. Wyman, Sycamore.

DeWitt County—Institute held with the 19th district institute at Clinton Jan. 14, 15 and 16, 1903; average daily attendance, 500; cost, $143.29. Officers elected for the ensuing year: President, Harvey C. Cline, Clinton; secretary, P. D. Williams, Clinton; treasurer, S. E. Newell, Clinton.

Douglas County—Institute held at Arcola Dec. 10 and 11, 1902; average daily attendance, 100; cost, $75. Officers elected for the ensuing year: President, Stephen Munson, Arcola, R. F. D. No. 1; secretary, Harvey Logan, Arcola; treasurer, W. S. Reed, Arcola.

DuPage County—Institute held at Wheaton, Feb. 18, 19 and 20, 1903; average daily attendance, 500; cost, $178.50. President, C. D. Bartlett, Bartlett; secretary, R. T. Morgan, Wheaton; treasurer, James W. McKee, Eola.

Edgar County—Institute held at Paris, Feb. 12 and 13, 1903; average daily attendance, 300; cost $73.60. Officers elected for the ensuing year: President, C. W. Curl, Paris; secretary, C. D. Smith, Greenview; treasurer, W. C. Slemons, Paris.

Edwards County—Institute held at Albion Nov. 5, 6 and 7, 1902; average daily attendance, 200; cost, $76.60. Officers elected for the ensuing year: President, Loran Jack, Albion; secretary, Charles Woodman, Albion; treasurer, M. E. Shurtleff, Bone Gap.

Effingham County—Institute held at Effingham Jan. 6, 7 and 8, 1903; average daily attendance, 45; cost, $75.00. Officers elected for the ensuing year: President, Peter Beever, Effingham; secretary and treasurer, W. J. Judkins, Shumway.

Fayette County—Institute held at Vandalia Nov. 11, 12 and 14, 1902; average daily attendance, 600; cost, $141.80. Officers elected for the ensuing year: President, Charles E. Cox, Vandalia; secretary, Richard Whittle, Vandalia; treasurer, R. T. Higgins, Vandalia.

Report of delegate to State institute: The progress made in institute work in this county the past year is all that could be desired. Early in the year the officers and committee came to the conclusion that something out of the usual line must be done to arouse the interest of the people—to get them to take part in the institute sessions, or at least to attend. Mr. Otwell induced us to try the "corn contest" for the boys. We did so, having solicited a list of premiums among the merchants and farmers of the county to the value of over $250.00. We advertised the "contest" in every school district and succeeded in getting 520 applications for seed corn, which was of the Boone County White variety and pure seed (and, by the way, we are going to give the boys another contest this year and perhaps the girls also), and, after a season of much damage by overflow, bugs and depredations by stock, we had a corn exhibit second only to Macoupin county in the State. Three hundred and twenty samples of ten ears of as fine corn as could be found anywhere in the State were scored by Mr. Will H. Young of Athens. We also had a general exhibit of corn, vegetables, fruit and flowers. The institute sessions were held Nov. 11-13 at Vandalia and we could hardly accommodate the attendance—the large opera house, the exhibit room at one side, ante rooms, all were jammed. The program was prepared for the best interests of the best interests of the county, and as much home talent as possible was secured. Had to work had for the success of the contest and institute meetings. Our county is now to the "front." We had with us from out of the county Director Fred C. Goodnow, John P. Galbraith, Prof. A. J. Glover, Will H. Young, D. I. Duncan, Mrs. J. J. Southworth and Prof. J. C. Fought. You may expect to hear greater things from Fayette county this coming year.

Very truly yours, RICHARD WHITTLE.

Ford County—Institute held at Roberts Jan. 21, 22 and 23, 1903; average daily attendance, 985; cost, $75.00. Officers elected for the ensuing year: President, John A. Scott, Piper City; secretary, T. J. Sower, Piper City; treasurer, D. A. Taylor, Gibson City.

Franklin County—Institute held at Benton Oct. 15 and 16, 1904; average daily attendance, 300; cost, $59.75. Officers elected for the ensuing year: President, William Bain, Gresham; secretary, S. F. Plumlee, Mulkeytown; treasurer, D. H. Little, Benton.

Fulton County—Institute held at Astoria, Oct. 28 and 29, 1902; average daily attendance, 1,250; cost $95.14. Officers elected for the ensuing year: President, B. C. Stoops, Ipava; secretary, E. H. Diehl, Ipava; treasurer, Geo. Shawver, Lewistown.

Report of delegate to State institute: The annual meeting of the Fulton County Farmers' Institute was held at Astoria, Ill,, Oct. 28 and 29, 1902. The speakers from abroad were: Mr. Henry Wallace, of DesMoines; Mr. Henry Augustine, of Normal; Mr. Dally, of the State university, and Mrs. H. M. Dunlap, of Savoy. We think we were fortunate in securing these interesting and instructive speakers, who entertained us admirably. Local talent became much interested, and we were no little surprised to find how much of such talent we had in store. We find that the prizes for farm exhibits are a good drawing card, and especially so are the prizes for corn. Since the advent of the farmers' institute in Fulton county, we can see many indications of the good it is doing. Farmers in many places are testing in a small way the various new crops, and the coming year many more will become like interested. The domestic science association held an interesting session, and delegates are in attendance at State meeting to report same. At our first meeting a few years since a very small crowd was in attendance, shamefully small, while this year we were unable to get hall room for half of the people, and hundreds were turned away.

B. C. Stoops,
Ipava, Ill.

Gallatin County—Institute held at Junction, Oct. 23 and 24, 1903; average daily attendance, 200; cost, $58.49. Officers elected for the ensuing year: President, James B. Hale, Cottonwood; secretary, Henry Hewitt, Junction; treasurer, A. Winterberger, Junction.

Greene County—Institute held at Greenfield, Dec. 11 and 12, 1902; average daily attendance, 350; cost, $59.60. Officers elected for the ensuing year: President, D. O. Simpson, Carrollton; secretary, E. Z. Curnutt, Carrollton; treasurer, T. J. Raffety, Carrollton.

Grundy County—Institute held at Mazon Jan. 30 and 31, 1903; average daily attendance, 250; cost, $55.57. Officers elected for the ensuing year: President, Willis A. Clark, Morris; secretary, Walter A. Rose, Mazon; treasurer, William Reardon, Morris.

Hamilton County—Institute was held at McLeansboro Oct. 7, 8 and 9, 1902; average daily attendance, 800; cost, $91.16. Officers elected for the ensuing year: President, John P. Stelle, Dahlgren; secretary O. L. Foltz, McLeansboro; treasurer, R. H. Redfearn, McLeansboro.

Report of delegates to State institute. Hamilton county was one of the first counties in the State to organize under the act creating the farmers' institute, and it has never failed to have a successful annual meeting; much of the time it has held quarterly meetings. And it has seldom failed to be represented in the general round-up. The institute of Oct. 7, 8 and 9, 1902, was far the most successful meeting ever held in the county; the attendance was larger, the interest greater and the display of farm products more general, more abundant and of finer quality. While we avail ourselves freely of the best talent offered by the State, our prime object is to enlist and cultivate home talent, and thus stimulate our own farmers to thought and progress. We owe much to the business and professional men of the county who encourage the exhibition of farm, orchard, kitchen and household products by giving liberal premiuns on them. We have to confess that our displays are our most attractive features, and they and the discussions are clearly leading to better farming.

JOHN P. STELLE,
President.

Hancock County—Institute was held with the 14th Congressional District Institute at Carthage Jan. 7, 8 and 9, 1903; average daily atterndance, 100; cost, $123. Officers elected for the nsuing year: President, W. B. Marvel, Carthage; secretary, R. E. Worrell, Bowen; treasurer, W. H. Moore, Carthage.

Hardin County—Institute held at Cave-in-Rock Oct. 28 and 29, 1902; average daily attendance, 500; cost, $75. Officers elected for the ensuing year: President, M. L. Tyer, Cave-in-Rock; secretary and treasurer, Ed. Schneider, Saline Mines.

Henderson County—Institute held at Biggsville Dec. 19 and 20, 1902; average daily attendance, 75; cost, $55.55. Officers elected for the ensuing year: President, Geo. T. Pearce, Biggsville; secretary, Charles W. McMillan, South Henderson; treasurer, Carl Beal, Reed.

Henry County—Institute held at Galva with the 15th Congressional district institute Dec. 17, 18 and 19, 1902; average daily attendance, 500; cost, $133.38. Officers elected for the ensuing year: President, John Shattuck, Woodhull; secretary, J. Carnes, Woodhull; treasurer, J. B. Hanlon, Galva.

Iroquis County—Institute held at Clifton Jan. 14 and 15, 1903; average daily attendance, 700; cost, $186. Officers elected for the ensuing year: President, David Brumback, Gilman; secretary, J. O. Reeder, Watseka; treasurer, H. C. Center, Watseka.

Jackson County—Institute held with the Twenty-fifth Congressional district institute at Murphysboro Nov. 13, 14 and 15, 1902; average daily attendance, 500; cost, $130.30. Officers elected for the ensuing year: President, Ed Worthen, Murphysboro; secretary, H. E. Allen, Murphysboro; treasurer, J. L. Miller, Murphysboro.

Jasper County—Institute held at Newton Nov. 21 and 22, 1902; average daily attendance, 250; cost, $75.00. Officers elected for the ensuing year: President Ed A. Ebbert, Montrose; secretary, A. E. Compton, Boos; treasurer, W. H. Kibler, Newton.

Jefferson County—Institute held at Mt. Vernon Nov. 13, 14 and 15, 1902; average daily attendance, 475; cost, $73.41. Officers elected for the ensuing year: President, Milan Baker, Mt. Vernon; secretary and treasurer, T. J. Holstlaw, Mt. Vernon.

Jersey County—Institute held at Jerseyville Nov. 12 and 13, 1902; average daily attendance, 120; cost, $94.66. Officers elected for the ensuing year: President, Charles H. Updike, McClusky; secretary and treasurer, J. W. Becker, Jerseyville.

Jo Daviess County—Institute held at Warren Jan. 20 and 21, 1903; average daily attendance, 500; cost, $75.00. Officers elected for the ensuing year: President, John Dallyn, Galena; secretary, not elected; treasurer, P. T. Hicks, Warren.

Johnson County—Institute held at New Burnside Dec. 11 and 12, 1902; average daily attendance, 375; cost, $67.09. Officers elected for the ensuing year: President W. J. Casper, New Burnside; secretary and treasurer, Ira J. Dunlap, Ozark.

Report of J. F. Buckner, Vienna, delegate to the State Institute: Perhaps more than a formal report should be made of our institute movement in Johnson county. The four annual institutes have all been held in New Burnside, located in the extreme northeast corner of the county. The largest church house in the town was crowded the first morning of the first day with farmers from all over the county to hear Prof. Hopkins on "The Soil." He held his audience almost motionless, so deeply were they interested, until about 1 o'clock. This soil study, connecting theory with practice, is what the farmers of Johnson county want, supported by ample appropriations. Every topic on the program was well handled and received. The institute has taken permanent root in this county, and a strong feeling exists in other parts of the county that the institute should be held in Vienna or some other town than New Burnside. Our delegate last year said: "If they wanted it down there they must vote it down there." The election of officers is always held on the last day, and it occurs late it the day, when many who live at a distance have been obliged to leave for home. School children, villagers and a few farmers around New Burnside thus out-vote and hold the institute. I will say that in order to interest of our people in real progressive farming, and to advertise our institute and to make known to the people what its purpose, scope and intention was, and is, I volunteered one speech in each township before the county meeting. This effort met with success in nearly every instance and partially accounts for the big attendance so early the first day. Whether or not the appropriation will do our county the most good by holding another institute in New Burnside might be considered under the law by the directors. Much corn land—as valuable as any in the State of Illinois—in Massac, Pulaski, Johnson and Alexandria counties is yet undrained. Under the law the institute might be used to educate the people along the lines of necessities for, and benefits derived from, the draining of that district.

Kane County—Institute held at Geneva Feb. 4, 5 and 6, 1903; average daily attendance, 1,300: cost, $278.56. Officers elected for the ensuing year: President, Fred W. Belden, Kaneville: secretary, Henry McGough, Geneva; treasurer, E. S. Bowdish, Elburn.

Kankakee County—Institute held at Manteno Feb. 3 and 4, 1903; average daily attendance. 170; cost, $90.27. Officers elected for the ensuing year: President, E. J. Viall, Peotone; secretary-treasurer, L. W. Smith, Manteno.

Kendall County—Institute held at Yorkville Jan. 13 and 14, 1903; average daily attendance, 540; cost, $119.51. Officers elected for the ensuing year: President, James Scofield, Bristol; secretary-treasurer, A. C. Gabel, Yorkvile.

Knox County—Institute held at Oneida Dec. 9 and 10, 1903; average daily attendance, 300; cost, $155.20. Officers elected for the ensuing year: President, A. G. Charles, Knoxville; secretary, O. L. Campell, Knoxville; treasurer, C. N. Butt, Knoxville.

Lake County—Institute held at Russell Feb. 3 and 4, 1903; average daily attendance, 220; cost, $88.04. Officers elected for the ensuing year: President, Warren Holland, Russell; secretary, W. E. Clow, Grayslake; treasurer, O. B. Whitmore, Gurnee.

La Salle County—Institute held at Ottawa Jan. 15 and 16, 1903; average daily attendance, 600; cost, $76.16. Officers elected for the ensuing year: President, D. M. Terry, Earlville; secretary-treasurer, T. M. Higgins, Ottawa.

Lawrence County—Institute held at Lawrenceville, Dec. 3, 4 and 5, 1902; average daily attendance, 1,100: cost $119.21. Officers elected for the ensuing year: President, James I. McCarty, Pinkstaff; secretary-treasurer, J. E. Dollohan, Birds.

Report of delegate to State institute: I was the only delegate from Lawrence county, and was called home suddenly, and did not get to report. The following is our report: We had a rousing institute. We offered premiums for exhibits of stock and farm products, also for dairy and poultry, fruits, etc. We had an excellent exhibit of all, and the largest and most enthusiastic crowd I ever saw in Lawrenceville, political gatherings not excepted. We expect to push institute work, and the interests of our county, which is one of the best in Illinois.

Respectfully,

ROBT. M. KUKWOOD,
Delegate.

Lee County—Institute held at Paw Paw Jan. 8 and 9, 1903; average daily attendance. 500; cost, $77.78. Officers elected for the ensuing year: President, Roy E. Swigart, Dixon; secretary, Fred A. Lawton, Dixon; treasurer, J. L. Hartwell, Dixon.

Livingston County—Institute held at Fairbury Feb. 17 and 17, 1903; average daily attendance, 250; cost, $94.67. Officers elected for the ensuing year: President, C. R. Tombaugh, Pontiac; secretary, Harry Carrithers, Pontiac; treasurer, Thurston Mortimore, Pontiac.

Logan County—Institute held with the 17th Congressional district at Lincoln Dec. 9, 10 and 11, 1902; average daily attendance, 309; cost, $94.25. Officers elected for the ensuing year: President, J. T. Foster, Elkhart; secretary, Donald Danken, Lincoln; treasurer, John Zeter, Lincoln.

Macon County—Institute held at Decatur Feb. 3, 4 and 5, 1903; average daily attendance, 500; cost, $147.87. Officers elected for the ensuing year: President, A. H. Bean, Blue Mound; secretary, J. B. Burrows, Decatur; treasurer, C. H. Scott, Mt. Zion.

Macoupin County—Institute held at Carlinville Nov. 19, 20 and 21, 1902; average daily attendance, 2,500; cost, $134.40. Officers elected for the ensuing year: President, R. E. Chiles, Carlinville; secretary, R. L. Comer, Comer; treasurer, L. B. Corban, Carlinville, R. F. D. No. 1.

Madison County—Institute held at Marine Oct. 15, 16 and 17, 1902; average daily attendance, 1,500; cost, $150.45. Officers elected for the ensuing year: President, Frank Troeckler, Mitchell; secretary and treasurer, Lee S. Dorsey, Moro.

Marion County—Institute held at Salem Nov. 12, 13 and 14, 1902; average daily attendance, 500; cost, $375.00. Officers elected for the ensuing year: President, A. V. Schermerhorn, Kinmundy; secretary, Will Leckrone, Salem; treasurer, T. S. Marshall, Salem.

Marshall County—Institute held at Wenona Dec. 5 and 6, 1902; average daily attendance, 350; cost, $78.50. Officers elected for the ensuing year: President, Elmer Quinn, Henry; secretary and treasurer, Mitchell Miller, Lacon.

Massac County—Institute held at Metropolis Oct. 30 and 31 and Nov. 1, 1902; average daily attendance, 150; cost, $60.81. Officers elected for the ensuing year: President, Andrew Davisson, Metropolis; secretary, Doric T. Slimpert, Metropolis; treasurer, J. F. McCartney, Metropolis.

Mason County—Institute held at Manito Oct. 8 and 9, 1902; average daily attendance, 250; cost, $82.93. Officers elected for the ensuing year: President, George Weimer, Topeka; secretary, George G. Hopping, Havana; treasurer, Miss Kate Brown, Manito.

Report of delegate to State Institute: Mason County held its annual institute Oct. 8th and 9th at Manito.

We find that holding our meeting early in the season has been met with the best results in the way of attendance and getting out a good exhibit.

The exhibit of farm products seems to be a good place in creating an interest.

We had with us E. E. Chester, of Champaign County, and Fred Rankin, of the Agricultural College, who treated their respective subjects in a masterly manner, and much interest was manifested in the discussions.

One of the evils we had to contend with was that the speakers not getting in to take their regular places on the program, and some not getting in at all, which was very disappointing; and had it not been for some good home talent would have been completely knocked out of two sessions.

We aim to hold institute at different places of the county, so as to reach the people of the different localities.

The citizens always subscribe the necessary funds to cover the premiums.

GEO. H. WEIMER,
Delegate Mason County.

McDonough County—Institute held at Macomb Dec. 11 and 12, 1902; average daily attendance, 64; cost, $56.60. Officers elected for the ensuing year: President, Harry Hunter, Macomb; Secretary, C. L Marriam, Macomb; treasurer, H. A. Knight, Macomb.

McHenry County—McHeury county held two institutes, one at McHenry Jan. 14 and 15, 1903, and one at Marengo Jan. 16 and 17, 1903; average daily attendance, 256; cost of two, $228.79. Officers elected for the ensuing year: President, H. T. Thompson, Marengo; secretary, J. H. Turner, Hebron; treasurer, F. C. Wells, Harvard.

McLean County—Institute held at Bloomington Jan. 6, 7 and 8, 1903; average daily attendance 600; cost, $504.42. Officers elected for the ensuing year: President, S. B. Mason, Bloomington; secretary, H. S. Seitz, Normal; treasurer, C. C. Wagner, Bloomington.

Mercer County—Institute held at Aledo Dec. 16 and 17, 1902; average daily attendance, 30; cost, $74.25. Officers elected for the ensuing year: President, Geo. E. Thornton, Millersburg; secretary, Alvah Joy, Aledo, R. F. D. No. 2; treasurer, Paul Ketzel, Reynolds.

Menard County—Institute held at Petersburg Dec. 9 and 10, 192; average daily attendance, 400; cost, $79.74. Officers elected for the ensuing year: President, W. E. Johnston, Athens; secretary, William Young, Athens; treasurer, William Young, Athens.

Monroe County—Institute held with the 22nd Congressional district institute at Waterloo Nov. 24, 25 and 26, 1902; average daily attendance, 253; cost, $151.55. Officers elected for the ensuing year: President, Balzer Schmidt, Waterloo; secretary, Louis Goeddel, Waterloo; treasurer, W. H. Limestall, Renault.

Montgomery County—Institute held with the 21st Congressional district institute at Hillsboro Dec. 9, 10 and 11, 1902; average daily attendance, 800; cost, $139.80. Officers elected for the ensuing year: President, E. C. Richards, Hillsboro; secretary, S. E. O'Bannon, Litchfield; treasurer, Edward Grimes, Raymond.

Report of delegate to the State Institute. The Montgomery County and Twenty-first Congressional District Farmers' Institute was held Dec. 9, 10 and 11, 1902, at Hillsboro, Ill. We were very unfortunate in having the very worst kind of weather during the entire session. And yet notwithstanding this fact, at several sessions, standing room was at a premium.

We were favored with an array of talent such as fall to the lot of but few counties in the State, as far as speakers were concerned. The ladies of the domestic science were to be congratulated on the interest evinced and the attendance at their session. We very much favor the holding of our meetings at different points in the county. It has already been decided to hold next year's meeting at Litchfield. A fund of $200 has already been raised and we expect to have an exhibit after the "Otwell plan," with a view to getting in line to do our part for the coming "World's Fair" St. Louis.

ARTHUR WARE.

Morgan County—Institute held at Jacksonville Nov. 11, 12 and 13, 1902; average daily attendance, 150; cost, $88.82. Officers elected for the ensuing year: President, Geo. C. Gibson, Jacksonville, R. F. D. No. 5; secretary, E. D. Scott, Franklin; treasurer, H. S. Keplinger, Franklin.

Moultrie County—Institute held at Sullivan Dec. 11 and 12, 1902, and at Bethany Feb. 10 and 11, 1903; average daily attendance, 126; cost, $75.00. Officers elected for the ensuing year: President, W. L. Rhodes, Bethany; secretary, Herbert Ward, Bethany; treasurer, W. R. Bone, Bethany.

Ogle County—Institute held at Byron Jan. 6 and 7, 1903; average daily attendance, 550; cost, $92.92. Officers elected for the ensuing year: President, D. D. Emery, Byron; secretary and treasurer, Franc D. Linn, Byron.

Peoria County—Institute held at Elmwood Feb. 5 and 6, 1903; average daily attendance, 220; cost, $83.49. Officers elected for the ensuing year: President, William West, Hanna City; secretary and treasurer, Ira Cottingham, Eden.

Perry County—Institute held at Pinckneyville, Nov. 12 and 13, 1902; average daily attendance, 80; cost, $92.77. Officers elected for the ensuing year: President, Henry Dickey, Cutler; secretary and treasurer, W. T. White, Cutler.

Piatt County—Institute held at Monticello Dec. 16, 17 and 18, 1902; average daily attendance, 150; cost, $85.52. Officers elected for the ensuing year: President, Wiley M. Dewees, Deland; secretary, F. A. Odernheimer, Monticello; treasurer, W. W. Royer, Monticello.

Pike County—Institute held at Pittsfield Dec. 18 and 19, 1902; average daily attendance, 250; cost, $82.56. Officers elected for the ensuing year: President, C. G. Winn, Griggsville; secretary, John W. Dorsey; treasurer, C. M. Simmons, Griggsville.

Pope County—Institute held at Golconda Oct. 29 and 30, 1902; average daily attendance, 100; cost, $57.35. Officers elected for the ensuing year: President, Joseph M. Baker, Hodgeville; secretary, Arthur Steagall, Hodgeville; treasurer, George Hacker, Golconda.

Pulaski County—Institute held at Villa Ridge Oct. 22 and 23, 1903; average daily attendance, 200; cost, $75.01. Officers elected for the ensuing year: President, W. H. Leidigh, Villa Ridge; secretary, H. M. Hogendobler, Villa Ridge; treasurer, James W. Dille, Villa Ridge.

Putnam County—Institute held at McNabb Dec. 1902; average daily attendance, 75; cost, $82.94. Officers elected for the ensuing year: President, J. Howard Williams, Putnam; secretary and treasurer, Amos B. Wilson, McNabb.

Randolph County—Institute held at Sparta Nov. 11 and 12, 1902; average daily attendance, 250; cost, $75.00. Officers elected for the ensuing year: President, G. W. Wilson; secretary, N. R. Lesley, Sparta, Houston; treasurer, William M. Beattie, Sparta.

Richland County—Institute held at Olney Oct. 16, 17 and 18, 1902; average daily attendance, 500; cost, $83.02. Officers elected for the ensuing year: President, Ed. Phillips, Olney; secretary and treasurer, Frank Britton, Olney.

Rock Island County—Institute held at Edgington Jan. 15 and 16, 1903; average daily attendance, 150; cost, $63.05. Officers elected for the ensuing year: President, F. A. Wood, Milan; secretary, A. Saddoris, Port Byron; treasurer, W. H. Ashdown, Port Byron.

Saline County—Institute held at Eldorado Oct. 21, 22 and 23, 1902; average daily attendance, 150; cost, $51.75. Officers elected for the ensuing year: President, Z. W. Young, Francis Mills; secretary, D. M. Butler, Raleigh; treasurer, C. H. Burnett, Eldorado.

Sangamon County—Institute held at Williamsville Oct. 14, 15 and 16, 1902; average daily attendance, 300; cost, $75.00. Officers elected for the ensuing year: President, J. F. Bird, Mechanicsburg; secretary, James A. Stone, Springfield; treasurer, L. H. Coleman, Springfield.

Report of delegate to State Institute: The main feature of the Farmers' Institute held at Williamsville last fall was the competition among the boys for the premiums offered for the raising of corn. Through the kindness of Funk Brothers Seed Company, of Bloomington, Illinois, we received corn for the contest in which near one thousand boys were contestants for the prize. The banks gave one hundred and thirty-five dollars towards the premiums. There were special premiums offered by the dealers in agricultural implements to the amount of one hundred and five dollars, and in some of the townships of the county individual premiums were offered to the boys in their own townships to the amount of over fifty dollars.

The books show that one hundred and thirty-five entries were made for the premiums. There were also about thirty reports sent in by the boys as to the manner in which they raised and cultivated their corn.

A first and second premium was given on these reports.

The plan this year is to have the instructions printed on the packages containing the seed corn when sent out.

Our desire now is to make the Sangamon County Farmers' Istitute, to be held at Mechanicsburg some time in October of the present year, one of the best ever held in the county.

We are not only trying to encourage the boys to plant pure bred seed corn, but the farmers generally, and by so doing we expect them to secure a large yield and a better quality of grain.

J. F. Bird.

Schuyler County—Institute held at Rushville Oct. 14 and 15, 1902; average daily attendance, 300; cost, $73.57. Officers elected for the ensuing year: President, J. E. Thompson, Layton; secretary, J. H. Boice, Rushville; treasurer, J. W. Whitson, Rushville.

Scott County—Institute held with the 20th Congressional district institute at Winchester Nov. 13 and 14, 1902; average daily attendance, 150; cost, $122.90. Officers elected for the ensuing year: President, N. R. Smithson, Winchester; secretary, Alonzo Ellis, Winchester; treasurer, T. J. Priest, Winchester.

Shelby County—Shelby County held two institutes—one at Strasburg Dec. 4 and 5, 1902, and one at Findlay Feb. 19 and 20, 1903; average daily attendance, 100; cost, $75.00. Officers elected for the ensuing year: President, W. E. Killam, Tower Hill; secretary, George Braden, Findlay; treasurer, William Middlesworth, Shelbyville.

Report of delegate to State Institute: To the Illinois Farmers' Institute: Shelby county has held two sessions of its Farmers' Institute during the institute year—one at Strasburg on Dec. 4 and 5, 1902, ond one at Findlay on Feb. 19 and 20, 1903. The attendance was fairly good at both places and people seemed to be considerably interested. Changing places in the county is working quite well with us, and our institute will probably be kept on wheels for some time to come. A Domestic Science club has been organized at every place where an institute has been held so far. Wishing the State Institute a pleasant and profitable meeting, I am, respectfully,

W. E. Killam,

President Shelby County Farmers' Institute.

Stark County—Institute held with the 16th Congressional district institute at La Fayette Dec. 11 and 12, 1902; average daily attendance, 175; cost, $84.05. Officers elected for the ensuing year: President, E. S. Buffum, Toulon; secretary, W. F. Nicholson, Toulon; treasurer, Irwin Nowlon, Toulon.

St. Clair County—Institute held at Belleville Nov. 19 and 20, 1902; average daily attendance, 300; cost, $115.22. Officers elected for the ensuing year: President, John Rumer, Mascoutah; secretary, L. B. Eidman, Mascoutah; treasurer, E. J. Herter, Mascoutah.

Stephenson County—Institute held with the 13th Congressional District Institute at Freeport Jan. 21, 22 and 23, 1903; average daily attendance, 675; cost, $146.85. Officers elected for the ensuing year: President Charles Foss, Buena Vista; secretary, H. M. Phillips, Lena; treasurer, F. B. Walker, Cedarville.

Tazewell County—Institute held at Hopedale Dec. 2, 3 and 4, 1903; average daily attendance, 300; cost. $82.64. Officers elected for the ensuing year: President, Ralph Allen, Delavan; secretary, O. H. Roberts, Mackinaw; treasurer, Thos. Viemont, Mackinaw.

Union County—Institute held at Anna Oct. 24 and 25, 1902; average daily attendance, 150; cost, $64.45. Officers elected for the ensuring year: President, E. R. Jinnette, Anna; secretary, L. L. Casper, Anna; treasurer, H. C. George, Anna.

Vermillion County—Institute held at Georgetown Jan. 14 and 15, 1903, average daily attendance, 200; cost, $75.05. Officers elected for the ensuing year: President, Geo. Hobson, Homer; secretary, J. F. Oakwood, Danville; treasurer, M. J. Wolford, Danville.

Wabash County—Institute held at Mt. Carmel Dec. 1 and 2, 1902; average daily attendance, 200; cost, $76.85. Officers elected for the ensuing year: President, Isaac W. Jaquess, Mt. Carmel; secretary, John J. Ewald, Bellmont; treasurer, E. C. Deputy, Maud.

Warren County—Institute hold at Monmouth Dec. 18 and 19, 1902; average daily attendance. 60; cost, $66.66. President, Euclid N. Cobb, Monmouth; secretary, John Halliday, Kirkwood; treasurer, Thomas McClanahan, Monmouth.

Washington County—Institute held at Nashville Nov. 18 and 19, 1902; average daily attendance, 300; cost, $84.10. Officers elected for the ensuing year: President, J. J. Randall, Nashville; secretary, A. C. Hann, Beaucoup; treasurer, E. P. Seibert, Ashley.

Wayne County—Institute held at Jeffersonville Oct. 16, 17 and 18, 1902; average daily attendance, 500; cost, $75. Officers elected for the ensuing year: President, E A. Rankin, Fairfield; secretary, R. B. Young, Fairfield; treasurer, R. B. Young, Fairfield.

White County—Institute held with the 24th Congressional district institute at Carmi Nov. 6, 7 and 8, 1902; average daily attendance, 800; cost, $125. Officers elected for the ensuing year: President, John W. Weis, Phillipstown; secretary and treasurer, Daniel Berry, Carmi.

Whiteside County—Whiteside county held two institutes, one at Lyndon Oct. 22, and one at Albany Jan. 15 and 16, 1903; average daily attendance, 200; cost, $75. Officers elected for the ensuing year: President A. N. Abbott, Union Grove; secretary, B. F. Hendricks, Morrison; treasurer, C. W. Mitchell, Morrison.

Will County—Institute held at Joliet Jan. 15, 16 and 17, 1903; average daily attendance, 2,000; cost, $287.95. Officers elected for the ensuing year: Pesident, E. L. Wilson, Manhattan; secretary and treasuer, Mark McClure, Manhattan.

Report of the delegate to State Institute. The Will County Farmers' Institute held a three days' session, Jan. 15, 16 and 17 of this year, with a large attendance, and a very interesting and instructive program. The Will County Institute has held 21 yearly three-day sessions. So you see we are now of age. The first session was held in the circuit court room in the court house at Joliet. There were about three dozen men and a half dozen women in attendance. In a few years we had to abandon the court room and seek larger quarters, which we did several times, until about ten years ago, we were compelled to occupy the large Joliet opera house, which at times has been filled, including all standing room. The attendance some days has been estimated at over 2,500.

We have an auxiliary called the ladies' session, with all lady officers. They are allow a half day each session, and their meetings are well attended, very interesting and profitable.

Our institutes have always been blessed with courteous, enthusiastic, painstaking officials. Our president, Mr. E. L. Wilson of Manhattan township, is an extensive farmer and dairyman.

We also have in connection with our institute a dairy farm and household exhibits, and to encourage these we pay liberal premiums. Some years all these exhibitions are very large and interesting. It is something difficult to find rooms or buildings suitable for the purpose. Our most interesting exhibitions in the past have been those held in the same building with the institute.

There is now a proposition on foot among the Joilet city officials to build a city hall, with ample room for all kinds of conventions, including Will county farmers' institutes and exhibits. I hope this will materialize.

We sometimes offer premiums for a contest of essays upon some farm topic for our young folks. Only a few respond, but the essays are good. Sometimes, however, they have too much of a professional ring, and the average farm boy or girl does not care to enter into competition with anything outside of original work. I doubt very much if some of these essays are beneficial.

The young folks are not attending our institute as they should. I believe the greater part of the farm and household exhibit contest should be turned over to them, and the premiums should be liberal.

There should be a general superintendent of exhibits who will not be afraid to reject an exhibit which does not come under the rules of the institute, and see to it that each competitor is treated fair and equal (especially when exhibits are not judged by score cards)—one who will arouse enthusiasm among the farmer boys and girls. The boys should be encouraged to plant and raise farm produce, and should be furnished with the proper score cards, and each exhibit judged by score cards.

We adopted a new feature last year in the manner of collecting revenue to pay the running expenses of the institute. A vice president was elected from each township in the county, whose duty it was to solicit his township for revenue. The head of each family, at least, was asked to contribute, and the contribution was very liberal.

We also adopted at each session about five resolutions in favor of some enactment or amendment to our laws. A great many more resolutions are adopted by all of our other farm organizations. I believe this rule will nearly hold good throughout the State of Illinois. If all the resolutions annually adopted by the farmers of Illinois were placed together their aspect would be a curiosity. Friendless, powerless, or, if I may use a short term, worthless. A few years ago, for my own satisfaction, I followed several farmer's resolutions to their destination.

Corporations or associations of business men concentrate their resolutions and petitions, and engage a man who thoroughly understands the merits of any proposed legislation to carry their demands into effect. If the legislation is not secured, this agent reports back why the law was not passed.

In the line of new work, there is agitation in favor of an experiment club and it is thought the plan will be in operation within a short time. E. L. Wilson, president of the institute, is sponsor for the adoption of the idea in our county.

In conclusion, in a few years more the rural district of Will county will be a complete network of telephone lines, free mail delivery routes and good roads. In my opinion there isn't anything else that will help Will county farmers more intellectually and socially, in fact, all the channels of farm life, than the three above mentioned achievemenents.

JOHN COLDWATER,
Joliet, Ill. *Delegate.*

Williamson County—Institute held at Marion Oct. 17 and 18, 1902; average daily attendance, 500; cost, $73.03. Officers elected for the ensuing year: President, T. M. Mitchell, Crab Orchard; secretary, M. N. Swan, Marion; treasurer, A. M. Townshend, Marion.

Winnebago County—Institute held at Rockford Feb. 3, 4 and 5, 1903; average daily attendance, 450; cost, 133.21. Officers elected for the ensuing year: President, W. L. Frisbie, Rockford, R. F. D. No. 1; secretary, Geo. F. Tulock, R. F. D. No. 2; treasurer, Theron Pierpont, Rockford.

Report of delegate to State Institute. I have the honor to report that Winnebago county held its 12th annual meeting on the 3d, 4th and 5th of Feb. 1903. It was well attended in spite of severe weather. Our local talent was most ably assisted by Mr. Erff and Mr. Dolby of Champaign, also Mr. Hinkey of DuBois. One of the topics discussed that brought out much favorable comment was the "Relation of Birds to Agriculture."—a subject of much interest to the farmers of northern Illinois. One of the nicest features of the institute was the boys' lesson. We have a boys' experimental club in Winnebago county, under the direction of Mr. P. J. Kern, that we are proud of. Organized one year ago with 33 members, it now has 180 names on the roll. A one-half day session was given to the boys and such subjects as these were discussed: "A Farmer's Boys' Interest in Live Stock." "My Experimental Work During the Year." Five-minute talks by members of the boys' club. "How a father may help along the work of a boys experiment club." Five-minute talks by the boys' fathers. "How the District School may help along the work of the boys' experiment club." Five-minute talks by teachers. I want to say that during this session our hall with a seating capacity of 600 was filled to overflowing. We also had a growing contest for boys. Our merchants, manufacturers and farmers contributed a liberal premium list. Ninety-seven boys entered this contest and we had a good display of corn and I believe 97 young farmers know a lot more about corn growing than they did a year ago. Our domestic science session was as enthusiastic as ever.

Respectfully,

GEO. F. TULLOCK,

Secretary Winnebago County Farmers' Institute.

Woodford County—Institute held at Minonk Dec. 17 and 18, 1902; average daily attendance, 100; cost, $58.03. Officers elected for the ensuing year: President, W. H. Smith, Eureka; secretary, John L. McGuire, Metamora; treasurer, F. H. Kauffman, Cruger.

SUMMARY.

Total number of institutes held during the year, 108.

Of these 68 were two-day institutes with from four to six sessions each and 40 were three-day institutes with from six to eight sessions each.

The total daily attendance was 42,938.

Average daily attendance, 397.

The total cost not including the expenses of the State Institute officers and directors for the 108 county institutes, $10,610.93.

Average cost per county institute, $98.24.

APPENDIX A.

The following represents the plan upon which a seed corn was sent to the several counties:

The enclosed sample of..............Grown and donated by.............

CONDITIONS.

This package of not less than 500 grains of seed corn of the variety named above, is presented on condition that the boy receiving same shall plant 360 grains of it in a square, with the balance planted in two rows on the south and west sides to fertilize and protect the inside rows; that he will cultivate it and harvest it and exhibit not less than ten ears of it at his home county farmers' institute, the ten ears or more for exhibition to be taken from the inside square and from nowhere else. It is further agreed by the boy receiving this corn that he will comply with the rules governing the exhibit of corn at his county institute and that he will attend at least one session of the institute, and that he will follow, as far as possible, the suggestions on the back of this package in regard to keeping record of growing the corn.

A. B. HOSTETTER,
Sec'y Illinois Farmers' Institute,
Springfield, Ill.

SCORE CARD

Of Illinois Corn Growers' Association, to be Used in Selecting and Judging Exhibits.

Uniformity of exhibit..10 points
Uniform type, size, shape, color and indentation.
Shape of ears..5 points
Cylindrical, straight rows, proportional length to circumference.
Color of ears..10 points
Uniform.
Market condition..10 points
Soundness, freedom from injury, maturity.
Tips of ears..10 points
Filled out with regular sized kernels.
Butts of ears..5 points
Kernels swelled out about shank regularly.
Uniformity of kernels..5 points
In type, shape and color.
Shape of kernels..5 points
Wedge shape, straight edges.
Length of ears..10 points
Conformity to standard.
Circumference of ears..5 points
Conformity to standard.
Space between rows..5 points
Small.

Space between kernels........... ....5 points
Small.
Per cent of corn..15 points
Conformity to standard.

Rules—1. The excess and deficiency in length of all ears shall be added, and for every inch thus obtained, cut one point.

2. The excess and deficiency in circumference of all ears shall be added, and for every inch thus obtained, a cut of one-half point shall be made.

3. For every per cent short of standard in proportion of shelled corn, a cut of one point shall be made.

VARIETY MEASUREMENTS.

Name of Variety.	Length of Ear—Inches.	Circumference of Ear—Inches.	Per cent.
Reid's Yellow Dent	10	7	88
Golden Eagle	9	7	90
Riley's Favorite	7	7	90
Leaming	10	7	88
Boone County White	10	7½	88
Silver Mine	9	7	90
White Superior	10	7	88

CHARACTER OF EXHIBIT.

Uniformity in size, shape, color, identation, etc., in fact all the points which go to make up a standard ear of corn is very essential. The ten ears of each sample exhibited should possess similar or like characteristics and present a uniform appearance.

In shape the ear must be true to type, carrying the same circumference from butt to the tip. The rows of kernels must be straight and parallel with the cob.

The object of this corn experiment is to determine the best seed corn, and by the best corn is meant that which will yield the most corn of the highest quality either for feeding or for market, and is consequently the most profitable to grow. The method consists in comparing the samples of corn with the standard scale of points which is supposed to contain all the qualifications of the best seed corn.

It is suggested that in addition to the premiums offered by the county farmers' institute on the corn exhibited, that premiums be given for the best report upon the growing of the corn to be made by the boy growing it.

This report should give the following items:

The kind of soil upon which it was grown; the previous crop upon the lot; the manure used, if any; the time and depth of plowing; the cultivation of ground before planting; the time of planting; the number of times and kind of cultivation; the implements used in cultivation; the number of hills; the number of stalks in each hill; the number of ears; the number of stalks that were without ears; the total weight at time of gathering; the injury from cut worms and insects. All to pertain only to the hills from the 300 grains on the inside square planted.

The keeping of this record will be of the most value to the boy who makes it. A simple and convenient blank on which to make this record may be secured from the experiment station by addressing Mr. Fred H. Rankin, Urbana, Ill., if you will send him a postal asking for same and giving your postoffice, county and name in full.

The varieties of corn sent out were as follows donated by the following corn breeders:

Boone county white, donated by John R. Clisby, Arcola, Douglas county.
" " " " by A. P. Grout, Winchester, Scott county.
Golden eagle, donated by Funk Brothers, Bloomington, McLean county.
Iowa gold mine, donated by B. F. Wyman, Sycamore, DeKalb county.
Leaming, donated by E. E. Chester & Son, Champaign, Champaign county.
Leaming, donated by J. H. Coolidge, Galesburg, Knox county.
Leaming, donated by Funk Brothers, Bloomington, McLean county.
Reid's yellow dent, donated by James Reid, East Lynn, Vermilion county.
Reid's yellow dent, donated by A. T. Doerr, Harvel, Montgomery county.
Reid'd yellow dent, donated by W. H. Fulkerson & Sons, Jerseyville, Jersey county.
Riley's favorite, donated by F. A. Warner, Sibley, Ford county.
Silver mine, donated by F. A. Warner, Sibley, Ford county.

A total of 4,591 packages of corn were distributed from the Illinois Farmers' Institute office.

In addition to these, nine counties sent out their own corn, some of them in quantities large enough to plant two acres.

APPENDIX B—DOMESTIC SCIENCE MATTERS.

OFFICERS OF THE ILLINOIS ASSOCIATION OF DOMESTIC SCIENCE.

President—Mrs. Joseph Carter, Champaign.
Vice-President—Mrs. W. L. Frisbie, Rockford.
Secretary—Miss Sallie Anthony, Bloomington.

CONSTITUTION OF ILLINOIS ASSOCIATION OF DOMESTIC SCIENCE.

ARTICLE I.

SECTION 1. The name of this organization shall be The Illinois Association of Domestic Science.

ARTICLE II.

SECTION 1. The objects of the Association shall be to stimulate interest in all that pertains to home-making; to induce the organization of domestic science associations; to coördinate the work of such associations, and to labor for the introduction of the study of domestic science into our educational system.

ARTICLE III.

SECTION 1. The following persons may be member of the Association:

Sec. 2. Delegates from county domestic associations organized in connection with the county farmers' institutes.

Sec. 3. Delegates from domestic science organizations of Illinois not affiliated with county farmers' institutes. In counties in which no domestic science organization has been formed in connection with the county farmers' institute, the president of such county institute may appoint delegates to the meeting of the State Association, and such delegates shall enjoy full membership, with privileges accorded other delegates.

Sec. 4. The officers of the year shall be members of the Association without reference to their appointment as delegates.

Sec. 5. Each county association and other housekeepers' clubs shall be entitled to two delegates.

ARTICLE IV.

SECTION 1. The officers of the Association shall be a president, a first vice president, a secretary and one vice president for each congressional district.

Sec. 2. The president, first vice president and secretary shall be elected by ballot at the regular annual meeting of the Association, but the vice presidents shall be elected or appointed at the several congressional institutes in any manner said institutes shall determine, and in case of no election or appointment, the vacancy shall be filled by appointment by the president of the State Association.

ARTICLE V.

SECTION 1. The duties of the president and first vice president shall be such as usually devolve upon such officers.

Sec. 2. The secretary shall keep a record of all meetings of the Association, of the meetings of the executive board, and perform such other duties as usually devolve upon such officers.

Sec. 3. It shall be the duty of the vice presidents of the congressional districts to be in the active formation of county and local societies, and to be responsible for a domestic science meeting at the time of the congressional institute.

Sec. 4. The president, vice president and secretary shall constitute the executive board of the Association.

ARTICLE VI.

SECTION 1. The State Association shall hold its annual meetings at the same time and place as the Illinois Farmers' Institute.

ARTICLE VII.

SECTION 1. Unless otherwise provided, a majority vote of the delegates present shall decide a question.

ARTICLE VIII.

SECTION 1. This constitution may be amended at any regular meeting by a two-thirds vote of the members present, notice having been given at a previous meeting.

CONSTITUTION FOR LOCAL SOCIETIES.

Anyone desiring a constitution for a county association or a local study club, or topics for program, can have them by applying to the secretary.

A WORD TO EVERY MEMBER OF DOMESTIC SCIENCE CLUBS.

Remember that this organization has set before itself two things to do, viz.: To increase our knowledge and interest in all that pertains to our work as home-makers; and to secure for every girl in our State a school training in the science and art of housekeeping.

Remember that you have your share of this work to do if it is accomplished. Prompt and regular attendance at meetings, active interest in programs, bringing in new members and interesting others outside of the organization are the means that will bring about the desired result.

MINUTES OF THE FIFTH ANNUAL MEETING.

The business session of the fifth annual meeting of the Illinois Association of Domestic Science was held Feb. 25, 1903, in the assembly hall of the Illinois hotel, Bloomington, with Mrs. Carter, the president, in the chair.

In her address, Mrs. Carter reviewed the past year's work and dwelt upon the necessity of increasing the interest of women in the subject of home-making. She also emphasized the need of working for the introduction of domestic science into the public schools of the State. The free scholarships in the household science department of our State university were spoken of and the conditions of obtaining them were explained. In view of the fact that many associations and clubs are asking for instruction and a definite plan of work, Mrs. Carter suggested that the State Legislature be asked for an appropriation of $5,000 for the purpose of securing a well trained woman who would do special investigation work in foods in the household science department at the university, and who would also visit the different clubs when called upon to do so. The subject of teaching sewing in the rural schools was also presented, together with a recommendation of text-books.

The following committees were then appointed by the president:

Committee on nominations—Mrs. J. R. Challicombe, Hillsboro; Mrs. J. O. Wood, Mt. Carmel; Mrs. Geo. E. Wheeler, Mazon.

Committee on resolutions—Mrs. I. S. Raymond, Sidney; Mrs. Harry Grundy, Morrisonville; Dr. Alma Braucher, Lincoln.

The minutes of the previous meeting, as read by the secretary, were approved. Reports were then called for from committee appointed at the last meeting.

Mrs. King reported that no action had been taken by the committee appointed to work, through legislation, for the introduction of domestic science into the schools, it having been considered advisable to postpone action to a later date. The report was accepted and the committee continued.

Mrs. Dunlap reported for the committee appointed to secure a woman's building at the State university, that there had been incorporated in the bill presented, by the trustees, to the Legislature, $100,000 for such a building.

The election of officers resulted as follows:

President—Mrs. Joseph Carter, Champaign.

Vice-President—Mrs. W. L. Frisbie, Rockford.

Secretary—Miss Sallie Anthony, Bloomington.

The following resolutions were presented by the committee, and unanimously adopted:

WHEREAS, The Illinois Association of Domestic Science in convention assembled at Bloomington, Ill., Feb. 24 to 26, 1903:

Resolved, First—That our thanks are due to the kind people of Bloomington for their interest, coöperation, and gracious hospitality.

Second—To the Business Men's association of Bloomington for providing the use of the Coliseum for the meetings of the Domestic Science association.

Third—To the Illinois hotel for courtesies extended and the use of their beautiful assembly room for its special sessions.

Fourth—To all those who have added to the interest of the programs with music and readings. We also wish to express our thanks to Mrs. Barlow and other members of the reception committee, and to the McLean County Domestic Science association for the social privileges we have enjoyed.

Resolved, That as an organization we earnestly desire to continue as our first object the improvement of the homes of our State and country.

Deeming our schools of vital importance to all we urge each association to increase, if possible, cleanliness, sanitation. and cheerful surroundings in the schools, and plead that the curriculum be not too extended in non-essentials.

That more attention be given to the training of the eye and hand, and to establishing of a greater interest and closer sympathy between patrons and teachers.

Resolved, That this association ask the Legislature to appropriate $5,000 to be used at the college of agriculture in employing a woman to carry on investigations in household science, and to do special work for the State, in the girls' clubs organized in the counties, and in the domestic science associations. And further, be it

Resolved, That the women of Illinois do most earnestly ask the General Assembly to restore to them the building on the State Fair grounds recently destroyed by fire, which stood as a representative of the homes of the State and their improvement.

MRS. EDITH RAYMOND,
ELLEN M. GRUNDY,
ALMA E. BRAUCHER.
Committee.

The secretary then called the roll of counties for reports of delegates. An unusually large number responded with a brief report of the work accomplished during the past year, after which the association adjourned to meet Thursday afternoon, when the following program was given:

AFTERNOON SESSION.

Thursday February 26—Coliseum 1:30 p. m.
Mrs. Joseph Carter, Champaign,
President of the Illinois Association of Domestic Science, presiding.

Music..High School Orchestra

Secretary's Report.........................Mrs. S. Noble King, Bloomington

Address—"What Should Mothers Ask for in the School Training of Their Children?"............Mrs Nellie Kedzie Jones, Berea, Ky.

Pantomime—"Home, Sweet Home,".. ......By Children of District No. 84, Miss Daisy Troxel, Teacher

Music.......................................High School Girls' Glee Club

Domestic Science in the Schools of Illinois....................Joseph Carter, Superintendent of Schools, Champaign, Ill.

Discussion:

1. How to put Domestic Science into the Schools.................. ....Alfred Bayliss, Springfield, State Superintendent of Public Instruction
2. The Training of Teachers in Domestic Science.......David Felmley, President State Normal University

General discussion.

Mr. L. H. Kerrick of Bloomington, spoke in favor of the teaching of domestic sciences, and offered the following:

Resolved, That the Illinois Farmers' Institute and the Illinois Association fo Domestic Science, in convention assembled, do hereby express themselves as heartily in favor of the teaching of domestic science in the public schools of the State.

The resolution as offered was unanimously adopted by a rising vote.

MARY R. KING,
Secretary.

NOTES FROM THE CLUBS]

Brown County—We now number fifty-nine members, and are preparing a program for the year to be printed. We discuss some topics at our meetings, trying to see it from a domestic science standpoint. We served our annual banquet at the county institute, and hope before this year passes to have some "cooking school" instruction.

We are proud to claim a number of young ladies among our members, and note their interest. Our membership extends over an area of nine miles, representing three townships, but we have not yet been able to organize other clubs.

Bureau County—We had one very successful meeting in connection with the Farmers' Institute, which was very interesting and well attended.

Mrs. Hefferin, from Englewood, delighted her hearers with her remarks on "The Relation of the Home and School." "Child Culture" and "Kitchen Science" were ably presented by Mrs. G. W. Boyden, of Sheffield, and Miss Ella Parker, of Princeton.

Domestic science forms a part of every club program in the county. Some are doing very good work. One conducted a sewing class of twenty-five little girls during the summer vacation which proved to be a great success. Interest in domestic science is growing more intelligent and more widespread.

Cass County—The Cass County Association of Domestic Science has closed a most successful year and we feel that the ladies are becoming much interested in the work and realize the great benefit of papers and discussions on household topics.

At several meetings receipes have been demonstrated and these were among the most interesting and instructive meetings of the year. The association subscribed for several magazines which have been of much use to members.

Champaign County—Champaign county has five local domestic science clubs. The Domestic Science Club of Champaign and Urbana is a section of the Woman's Club. We wish to be affiliated with the Farmers' Institute.

Philo Home Improvement Society—We have forty-five members. The meetings are held monthly at the homes of the members. A year book was published last year. We alternate demonstration and literary meetings.

Rantoul Domestic Science Club—The Rantoul Domestic Science Club was organized by Mrs. E. O. Chester, of Champaign; Jan. 21, 1903. A full corp of officers were elected, also an executive committee. Twelve ladies presented their names as charter members. The meetings are held on the last Wednesday of every month at 2:30 p. m. Two regular meetings have been held. The club membership at present numbers about eighteen, but the prospects are bright for a large membership. Books from the Illinois Domestic Science library are being circulated among the members, and Farmers' Bulletins on subjects pertaining to food and sanitation are being read. Some of the subjects that have been discussed at the meetings have been: "The Food Value and Dangers of Milk," and "Winter Vegetables, Their Preparation for the Table; and the Dangers in Canned Vegetables."

Fisher Association of Domestic Science—We organized Feb. 7, 1903, with a membership of eleven enthusiastic workers. Regular meetings are to be held the first Saturday of each month.

Christian County.—We have have a membership of 55, and our study this last year has been on domestic economy and history. Our members take a greater interest when we have some special work of this kind. A few weeks a program committee met, and we made out programs for the whole year. In that way we can do better work, because each one will be furnished a program and will know in advance what is assigned to her.

Mt. Auburn Domestic Science Association.—I am much pleased to be able to report that our Domestic Science association is growing in interest and members. When we began, a little more than a year ago, we had six members, and now we have more than 50. We meet once in two weeks at the homes of the members. Our programs are made out two weeks in advance of the meeting. A special effort is made to have to have something bright, humorous and interesting, together with plenty of music, on the program, followed by serious study of the lesson, and it has been found that larger attendance and closer attention are secured in that way. We have socials and picnics, at which times the members and their families are invited. We have a circulating library of our own, from which we derive much benefit, and we have $25 00 in the treasury to enlarge our library. Our members are very earnest and enthusiastic, and we feel that we are doing better work all the time.

Blue Mound Club.—Our club of 85 members is in a flourishing condition. We meet every two weeks at the homes of the members, where we have study, querries, reading and music. Our president suggests that we select some book from the Domestic Science library to take our lessons from.

Crawford County.—The Crawford County Association of Domestic Science has completed its fourth year of successful work. There are two country clubs, which meet regularly every two weeks. One has a membership of 30, the other 18. More than half the total membership is made up of young single women. These meetings grow in interest continually, some of the members going several miles to attend them. The effect on the members has noticeable in renewed interest in attention to home-making, preparation of foods, household duties, public questions, and the ability to give expression to thought. There is increasing demand for more clubs, and others will be organized soon.

Edgar County.—Our Domestic Science club has been organized for a little more than a year and a half, and although our work has not been of a very definite character, yet it has in many ways been a benefit to our community. Before the days of the club when we women left our work it was usually for a trip to town, and we seldom saw our neighbors. We prepare no papers, but read helpful articles.

Fulton County.—Our county association has had only the one meeting; that was held at the time of the farmers' institute. But we have a township association here at Lewistown, that holds its meetings the first Thursday of each month, and which we find very interesting. We have about 30 members, and are divided into four class, each with a leader, who assigns the work to the members of her class and sees that it is carried out. These leaders, with the president and secretary, form the program committee, and the programs are made out for four months. At present one class has for its subject, "Study of Foods," and the subjects under that head for the four meetings are: "Review of Elements of Foods," "Description and Discussion of Actual Meals," "Left Overs" and "Kitchen Gardens." Class two has for its subject, "Saving of Strength," and the four special subjects are: "Arrangment of Rooms," "Bulletins on Saving Strength," "Utensils" and "System in Time." Class three has "Sewing," and under that head has: "What is Done First in Plain Sewing?" "Repairing," "Cutting" and "Buttons and Edgings." Class four has "Art in the Home," with the four subjects: "Floors," "Windows," "Walls" and "Pictures."

With this system the work is made easier for the president, and each member feels that she has some of the responsibility. Our club is formed of town and country ladies in this township, and we have found that a very pleasant feature indeed. During this winter we have met several times with the teachers in the public schools who are interested in getting manual training and domestic science introduced, and are hoping to make a little progress toward that end by another year. Indeed there has been quite a little progress made already, as the children have done quite a bit of sewing, and the boys some very good simple carpenter work. We hope to be allowed some time in the near future to introduce something in the line of cooking and study of foods. None of this work has been done officially yet, however. It is thought best to get the children and parents thoroughly interested first before any appropriations are asked for of the board of directors. If there is anything in this description of our work that will be of benefit to others, I am glad to give it.

Greene County—The Greene County Domestic Science Association held its annual meeting in connection with the Greene County Farmers' Institute Dec. 11, 1902.

The Whitehall Domestic Science Association, which was organized at the same time as the Greene County Association and with the same officers, is in a flourishing condition. There have been no meetings missed except when the weather was so bad that attendance was almost impossible. The membership counts up to about 60 and all are much interested in the work.

Grundy County—Grundy county holds a meeting with the annual meeting of the Farmers' Institute.

Jersey County—The association has steadily grown until there are 108 names on the roll. The meetings are held once a month in the court house, and everyone is welcome to attend, whether a member or not. The program is prepared by the executive committee who appoint various ones to open the discussions on the different subjects. The subjects are published in the county papers, and the ladies come prepared to give their experience in those lines, as each subject presented is open to discussion. The meetings are always very pleasant and helpful. The association subscribed for four periodicals on cooking or housework and has quite a valuable though small library. Last summer the board of directors of Pisa Chautauqua asked the association to furnish the program for one afternoon during the session of the Chautauqua. This was done, and four associations were represented. Mrs. A. L. Spies, president of the Madison County Domestic Science Association, read an excellent paper on "The Art of Home Making." Mrs. H. W. Hand, president of the Greene County Association, read an extremely interesting paper on "Domestic Science in Public Schools." These were followed by lively discussions and the enthusiasm rose to a high pitch. We hope to do even more in 1903.

Kankakee County—We now have 50 members and a very interesting society. In regard to the question of raising money, we have found it advisable the last two years to charge a fee of 50 cents. We subscribed for two magazines, one being the "Kitchen Magazine."

McHenry County—The annual meeting of the Domestic Science Association was held in connection with the Farmers' Institute. There was a large attendance. The business meeting was held in the afternoon at which Mrs. H. M. Dunlap, of Savoy, and Mrs. S. Noble King, of Bloomington, were present, also representatives of the South Dunham and other auxiliary clubs. Subjects for study were discussed, and a list of books and magazines given that had proved most helpful in domestic science work.

The South Dunham Club—We have a membership of 12. We meet every two weeks. The club is in a good condition.

The North Marengo Domestic Science Association—The North Marengo Domestic Science club is organized and takes up such subjects for study as the committee selects.

The McHenry Domestic Science Club—Was organized in January, and we now have 37 members. We have one meeting each month and hope to send a delegate to the annual meeting next year.

Madison County—The interest manifested in the domestic science meetings becomes greater every year. The largest halls in the county are not large enough to hold the crowds that come to these meetings.

McLean County—The McLean County Domestic Science association reports an increase in membership and interest.

The meetings were held once a month; were well attended and there is a desire to study and acquire practical knowledge along our special lines of work. In April prizes were offered the pupils of the district schools for displays of flowers raised on the school grounds, the money to be expended for books for the school library. During the summer months the meetings were held at the homes of the members, and demonstration lessons given, the social hour which followed being a pleasant feature.

October 4, was "Bird and Flower Day,' for the pupils of the district schools, to stimulate in them the study of the habits and value of the birds of Illinois, and to show the result of their efforts in beautifying the school yards.

Report of Irving School Teachers' and Patron's Club—Having affiliated with the McLean County Domestic Science association, Nov. 7, 1902, we introduced sewing in our seventh and eighth grades; at the beginning of this year, January, 1903, we furnished a kitchen and pantry in the basement of our school, and with the aid of Mrs. S. Noble King are giving a course of 15 lessons in cooking and domestic science, which is arousing much interest among pupils and patrons.

Morgan County—The Domestic Science Round Table of Jacksonville numbers 50 members. Meetings are held bi-monthly, and both attendance and interest have grown with each succeeding meeting.

The Household Science Club—Was organized in February, 1885, with eight members. It is the oldest domestic science club in the State. The present enrollment shows 35 members.

Ogle County—This county has a very active society of 65 members. They have organized among their school girls the "Outlook Club." Those children are taught to observe, studying the chemistry of food. They have little meetings where the children are taught to entertain. The girls are from the ninth, seventh and eighth grades and the first year in high school.

Pike County—There is but one society in the county outside of the county organization. We usually have a very large attendance. We had Miss Beatty, of the university, at one of our meetings which was held in the court house. The room was filled to over-flowing with students and others, and it was very interesting.

A society of girls has been formed in my immediate neighborhood, and while they are not under the immediate auspices of the association, are taking sewing lessons, and in the summer meet once a week.

Pulaski County—After June our meetings were held each month at the homes of different ladies. The meetings were a success educationally and socially. Some of the subjects that were discussed were: "The Daily and Weekly Program of Work," "Bread Making," "Waste and Economy in the Home," "The Laundry," etc., etc. The ladies that attended these meetings derived great benefit and new ideas in home-making.

Randolph County—The third annual meeting of the Randolph County Association of Domestic Science met with the farmers' institute and provided the program for the afternoon. We had a good program.

Our county has three local societies but they have not done any public work. We have trouble in getting the ladies interested in the business meetings, and a hurried meeting is the result with little interest.

Richland County—The Richland County Domestic Science Association met with the farmers' institute in 1902, and provided a program for the afternoon.

Sangamon County—We are glad to report that the interest in domestic science in our county is gradually increasing. We hold our annual meeting in connection with the county farmers' institute.

We are able to report two local clubs in Sangamon county this year—one at Auburn with 24 members, organized two years ago. They meet bi-monthly and discuss subjects of interest to every housewife. Last winter a series of cooking lessons were given under the auspices of the domestic science club, which were well attended by the ladies of Auburn and vicinity. The members of the Auburn club are intensely interested in domestic science work and find it of great benefit to them. A domestic science club has been organized at Williamson very recently with a membership of 18 members.

Schuyler County—We have a very good association, a membership of about 40 I think. We all enjoy our meetings. We are glad that it started. Through the winter I think there was but one meeting that was not well attended and that was held on a very stormy day.

Stephenson County—The Stephenson County Domestic Science Association held three meetings during the summer of 1902. Three townships are organized. The societies have used, with other topics, the U. S. bulletins. With the township organizations women can be reached who think it impossible to attend the county meetings, and they become deeply interested in the work. The coming year it is expected to used the library books.

Wabash County—The year 1902 was a successful one for Wabash County Domestic Science Association. During the summer of 1901 we visited the different precincts of the county for the purpose of explaining the objects of the association, but did not succeed in organizing any local clubs. However, we awakened an interest in the work which resulted in a good annual meeting. During the summer of 1902, we organized one local club which meets once a month at the homes of the different members for the purpose of discussing the topic selected at the previous meeting. (These topics are always practical, pertaining to housekeeping.) Every member present is expected to take part in the discussion.

No refreshments are served.

Our annual meeting was a complete success, notwithstanding the fact that the "Low-hung clouds poured their garnered fullness down." The attendance was good and every number on the program was well rendered. The outlook for the society in our county is very good indeed.

Washington County—Our club was organized three years ago with a membership of six. We now number 19, about evenly divided between country and town. Our attendance is fair and interest good. The meetings are held on the first Wednesday of each month at the homes of the members. Our programs consist of music, papers on given topics and general discussion, with a social half hour. We have the four following magazines: The American Kitchen, Good Housekeeping, Ladies' Home Journal and The Boston Cooking School. We borrowed three books from the State library a few months ago, which we enjoyed and from which we derived much benefit. Then we decided to buy some books for ourselves. At the county institute in November we held an exhibition of vegetables, cereals, fruits, pastries, and fancy work. While it was on a small scale, we feel that it was a success and the beginning of something greater, and that it has awakened new interest among the people throughout the county. Advice or suggestions of any kind are favorably received.

Winnebago County -Our society was organized with eight members. Now we have an organization of 20, and we meet once in two weeks excepting during the excessively hot weather in summer. We have incorporated another society, which is not organized in connection with us, but does about the same kind of work.

OFFICERS OF COUNTY ASSOCIATIONS OF DOMESTIC SCIENCE CO OPERATING WITH THE FARMERS' INSTITUTES IN THE SEVERAL COUNTIES.

The first names given in each county are the names of officers of the regular county organization, and they are responsible for domestic science programs at the farmers' institute.

Counties having no Domestic Science association are not entitled to free scholarships in the household science department of the State University, but other counties may have additional ones which can be accredited to these.

County.	President's Name and Location.	Secretary's Name and Location.
Adams	Mrs. Joseph Nevins, Camp Point	Mrs. J. H. Kirkpatrick, Clayton
Alexander		
Bond	Miss Eda Burkhardt, Sorento	Miss Pearl Denny, Sorento
Boone	Mrs. A. T. Ames, Belvidere	Mrs. Lyman Andrews, Belvidere
Brown	Mrs. George McMillen, Mt Sterling	Miss Mary Ritchey, Mt. Sterling
Bureau	Miss Donna I. Pervier, Sheffield	Miss Lola Hays, Wyanet
Calhoun	Miss Anna Wood, Hamburg	
Carroll	Mrs. Lucy J. Jenks, Savanna	Miss Marie Dupuis, Savanna
Cass	Mrs. Henry Hunt, Virginia	Miss Virginia Black, Virginia
Champaign	Mrs. O. E. Chester, Champaign	Mrs. I. S. Raymond, Sidney
.. do	Mrs. Carrie Robinson, Philo, Philo, Club	Miss Eleanor Godfrey, Philo, Philo Club
.. do	Mrs. E. O. Chester, Champaign, Champaign and Urbana Domestic Science Club	Mrs. J. W. Fuqua, Champaign, Champaign and Urbana Domestic Science Club
.. do	Mrs. William Jackson, Fisher, Fisher Club	Mrs. Myrtle Robinett, Fisher, Fisher Club
.. do	Mrs. L. R. Gennung, Rantoul, Rantoul Club	Mrs. Maude K. Hardesty, Rantoul, Rantoul Club
.. do	Mrs. H. M. Dunlap, Savoy, Savoy Club	Mrs. M. Belle Peterman, Savoy, Savoy Club
Christian	Mrs. Harry Grundy, Morrisonville	Mrs. Edwin Sands, Morrisonville
.. do	Mrs. D. A. Griswold, Blue Mound, Mt. Auburn Club	Miss Ruby Armstrong, Blue Mound, Mt. Auburn Club
Clark	Mrs. Nora Nickols, West Union	Mrs. Lalla Adams, McKeen
Clay	Mrs. Samuel White, Flora	Mrs. Donald A. McQueen, Flora
Clinton		
Coles	Mrs. John L. Glaser, Charleston	Mrs. J. O. Linder, Loxa
Cook		
Crawford	Mrs. Lucy M. Ormiston, West York	Miss Etta Hoskinson, Trimble
.. do	Miss Bertha Rains, Hutsonville, Pansy Club	Miss Nellie Musgrave, Hutsonville, Pansy Club
Cumberland	Mrs. Emma Cowper, Neoga	Mrs. John Young, Neoga
DeKalb	Mrs. Elias C. West, Sycamore	Miss Mary Hooker, Sycamore
DeWitt		
Douglas	Mrs. Myrtle Kaga, Filson	Miss Maude Hall, Arcola
DuPage		
Edgar	Miss Ita Briscoe, Kansas	Miss Zelma Nay, Kansas
.. do	Mrs. W. C. Slemons, Paris	Miss Anna Laughlin, Paris
Edwards	Miss Lillian C. Hall, Albion	Miss Jennie Gill, Albion
.. do	Mrs. T. A. West, Albion, Housekeepers' Club	Housekeepers' Club
.. do	Mrs. Ada Shurtleff, Bone Gap, Bone Gap Club	Mrs. Emily Gould, Bone Gap, Bone Gap Club
.. do	Mrs. Frank Walser, West Salem, West Salem Club	Miss Elizabeth Ebennan, West Salem, West Salem Club
Effingham	Mrs. Gertrude Hand, Dieterich	Miss Cora Field, Dieterich
Fayette		
Ford		
Franklin	Mrs. John B. Moore, Benton	Mrs. W. R. Ward, Benton
Fulton	Mrs. W. S. Edwards, Lewistown	Miss Nellie F. Zoll, Table Grove
Gallatin		
Greene	Mrs. W. C. Baker, White Hall	Mrs. W. P. Bates, White Hall
.. do	Mrs. Ed. Ford, Greenfield	Mrs. Richard Simmons, Greenfield
Grundy	Mrs. Geo. E. Wheeler, Mazon	Mrs. N. W. Walsh, Wauponsee
Hamilton	Miss Mattie Cloud, McLeansboro	Mrs. Anna Randall, McLeansboro
Hancock	Mrs. Samuel Chapman, Elvaston	Miss Alice Marvel, Carthage
Hardin	Mrs. P. J. Englis, Karber's Ridge	Miss Ida Warford, Karber's Ridge
Henderson	Mrs. N. Q. Welch, Reed	Mrs. Nettie Fitz, Decorra
Henry	Mrs. J. V. Streed, Cambridge	Miss Nellie Munson, Cambridge
Iroquois		
Jackson	Mrs. Mary C. Easterly, Carbondale	Mrs. Cora England, Carbondale
Jasper	Mrs. Belle Shup, Newton	Mrs. Ella Walker, Newton
Jefferson	Mrs. Geo. Patterson, Mt. Vernon	Mrs. Silas Rogers, Mt. Vernon
Jersey	Mrs. Walter E. Carlin, Jerseyville	Miss Grace Enos, Jerseyville
JoDaviess	Mrs. Mary Seace, Warren	Miss Sadie Hicks, Warren
Johnson	Mrs. W. J. Casper, New Burnside	Mrs. S. J. Edrington, New Burnside
Kane	Mrs. J. Frank Kelly, Geneva	Mrs. Niles Wheeler, Geneva
Kankakee	Mrs. Verne Beedy, Manteno	Miss Clara Parker, Manteno

County.	President's Name and Location.	Secretary's Name and Location.
Kendall		
Knox		
Lake		
LaSalle		
Lawrence	Mrs. May Derr, Pinkstaff	Mrs. Rose Mayo, Bridgeport
Lee	Mrs. Carrie Cleary, Dixon	Miss Emma Hey, Dixon
Livingston	Mrs. Charles Meyer, Pontiac	Miss Eva Hayes, Pontiac
Logan	Mrs. S. S. Hoblitt, Lincoln	Dr. Alma Braucher, Lincoln
McDonough	Mrs. O. M. McElvain, Scottsburg	Mrs. Ella Graham, Scottsburg
McHenry	Mrs. O. H. Gilmore, Woodstock	Miss Ethel Turner, Hebron
.. do	Mrs. Kate Wells, Harvard South Dunham Club	Mrs. Ellen Murrill, Harvard, South Dunham Club
.. do	Mrs. Nora Porter, Marengo, North Marengo Club	Mrs. J. D. Wright, Marengo, North Marengo Club
.. do	Mrs. E. Phillips, McHenry, McHenry Club	Mrs J. D. Smith, Ringwood, McHenry Club
McLean	Mrs. Jennie C. Barlow, Bloomington	Miss Sallie Anthony, Bloomington
.. do	Mrs. Frank English, Bloomington, Irving School Club	Mrs. P. F. Hoierman, Bloomington, Irving School Club
Macon	Mrs. Fannie Sedgewick, Decatur	Mrs. A. T. Whitsell, Decatur
Macoupin	Mrs. M. Luther Keplinger, Carlinville.	Mrs. Walter R. Crew, Carlinville
Madison	Mrs. L. A. Spies, St. Jacobs	Miss Anna Robinson, Liberty Prairie
Marion	Mrs. Clark Mercer, Centralia	Mrs. Charles E. Hull, Salem
.. do	Mrs. Margaret Martin, Salem	Miss Stella Young, Salem
Marshall	Mrs. J. A. William, Henry	Mrs. C. M. Wright, Varna
Mason	Mrs. Dollie Harpham, Havana	Mrs. Martha Pett, Mason City
.. do	Mrs. Cora Benscoter, Manito, Auxiliary Club	Mrs. Ada Knollhoff, Manito, Auxiliary Club
Massac	Mrs. Retta Devers, Choat	Miss Maude Melton, Metropolis
Menard		
Mercer	Mrs. T. A. Vernon, Aledo	Mrs. Samuel McHard, Aledo
.. do	Mrs. T. A. Vernon, Aledo, Local Club	Mrs. O. J. Ingmire, Aledo, Local Club
Monroe	Mrs. M. R. Hoeuer, Waterloo	Mrs. W. J. Harms, Kidd
Montgomery	Mrs. J. R. Challacombe, Hillboro	Mrs. E. C. Richards, Hillsboro
Morgan	Mrs. K. D. O'Neal, Arnold	Mrs. Dora Strawn, Jacksonville
Moultrie	Mrs. Matt. Logan, Bethany	Mrs. Bertha Rhoades, Bethany
Ogle	Mrs. E. M. Leonard, Byron	Mrs. H. V. Potter, Byron
Peoria	Mrs. John M. Hart, Elmwood	Mrs. William West, Hanna City
Perry	Mrs. Etta R. Edwards, Pinckneyville	Mrs. Mattie Milligan, Pinckneyville.
Platt	Mrs. Jessie Holmes, Monticello	Miss Mary Davidson, Monticello
Pike	Mrs. M. A. Westlake, Pittfield	Mrs. W. Y. McMahon, Griggsville
Pope	Mrs. A. H. Floyd, Golconda	Miss Stena Wellman, Golconda
Pulaski	Mrs. H. F. Delaney, Villa Ridge	Miss Lizzie Leidigh, Villa Ridge
Putnam	Mrs. Oliver Wilson, Magnolia	Mrs. J. B. Thornton, Magnolia
Randolph	Mrs. W. A. McIntire, Sparta	Mrs. Nellie Moreland, Sparta
Richland	Mrs. H. G. Hitch, Olney	Miss Belle Wilson, Olney
Rock Island		
St. Clair		
Saline	Mrs. H. S. Anderson, Harrisburg	Mrs. T. H. Neptune, Harrisburg
Sangamon	Mrs. Charles Darnall, Buffalo	Miss Kate Maxey, Pasfield
.. do	Mrs. B. L. Kessler, Auburn, Auburn Club	Mrs. Cora Kessler, Auburn, Auburn Club
.. do	Mrs. William Council, Williamsville, Williamsville Club	Miss Julia Conrey. Williamsville, Williamsville Club
Schuyler	Mrs. Roll Stover, Rushville	Mrs. Cyrus Dewitt, Rushville
Scott		
Shelby	Mrs. Hilda P. Trower, Shelbyville	Mrs. Geo. Gaybill, Shelbyville
Stark	Mrs. H. A. Hammond. Wyoming	Mrs. W. R. Sandham, Wyoming
Stephenson	Mrs. G. W. Shippy, Lena	Mrs. H. E. Confer, Lena
.. do	Mrs. Thomas Richards, Eleroy, Harlem Township Club	Miss Cecelia Kostenbader, Eleroy, Harlem Township Club
Tazewell	Mrs. Julius Snyder, Hopedale	Mrs. Harry Griesemer, Hopedale
Union	Mrs. Geo. W. Hess, Anna	Miss Mary Crawford, Jonesboro
Vermilion	Mrs. William Douglas, Catlin	Mrs. M. T. Cloyd, Catlin
Wabash	Mrs. J. O. Wood, Mt. Carmel	Miss Kate Brines, Mt. Carmel
Warren		
Washington	Mrs. W. L. Troutt, Nashville	Miss Emma Buhrman, Nashville

County.	President's Name and Location.	Secretary's Name and Location.
Wayne	Mrs. Kate Whitaker, Jeffersonville	Miss Mary Morris, Jeffersonville
White	Mrs. J. W. Weis, Phillipstown	Miss Viola E. Stuart, Carmi
Whiteside		
Will	Mrs. Adam Clow, Plainfield	Mrs. John VanHarn, Plainfield
Williamson	Mrs. Rosalie Hendrickson, Marion	Miss Minnie Copeland, Marion
Winnebago	Mrs. W. L. Frisbie, Rockford	Miss Hattie Enoch, Rockford
Woodford	Mrs. Rolla Marshall, Eureka	Mrs. Richard Banta, Low Point

COURSE OF DOMESTIC SCIENCE WORK FOR RURAL SCHOOLS.

Miss Bevier, head of the Department of Household Science, University of Illinois, was requested to prepare a short course in domestic science which might be used in any rural school where there was no special equipment for such teaching.

SUGGESTIONS FOR WORK IN HOUSEHOLD ARTS FOR THE RURAL SCHOOLS OF ILLINOIS.

At the request of the committee the following list of subjects bearing upon the home life have been suggested. The course is not in any wise complete, and some teachers may prefer to change the order of the topics, but it is hoped that by the use of these topics a closer connection may be established between the home work and school study:

FIRST MONTH.

Sewing—Name stitches; running, stitching, over-handing, hemming. Have pupils use these stitches in making cheese cloth dusters, holders, dish towels, or aprons. Darn stockings brought from home.

SECOND MONTH.

Water—Sources; kinds; hard, soft. Test samples by using soap. Show how hard water wastes soap. Soften with soda or ammonia.

Uses—I. As a cleansing agent. Talk about personal cleanliness. Show that it includes care of skin, hair, teeth, nails.

Laundering—What does it include? Where should soiled clothes be kept? Emphasize care of bed linen of diseased persons. Have pupils wash dusters, dish towels. Make starch of different thicknesses. Discuss proper methods of washing, rinsing and drying to prevent fading.

THIRD MONTH.

Waters—II. Uses for cooking purposes. 1. To soften the cell walls of vegetables. (Talk about structure of potato.) 2. As a source of heat. Explain use of double boiler. Boil water; test temperature with thermometer. Show that temperature of water inside double boiler is not 212 F., so some things can not be well cooked in a double boiler. Talk about safe water for drinking purposes. Show how wells and streams are made unsafe. Boil a potato with skin on in soft water. Repeat the experiment using hard water. Compare results. Cook cereals.

FOURTH MONTH,

Air—Composition properties; invisible, inodorous, colorless. Prove by experiment that it is elastic and has weight. Talk about necessity of pure air to breathe. Show how candle will not burn without air. Show how to air and ventilate school room; how to arrange window sashes to let air in and out and prevent drafts. Explain heating apparatus; have children ventilate room and watch theremometer. Have children report temperature of their homes. Show that impure air is a source of disease. Tell story of Black Hole of Calcutta. What is the barometer? Talk about cooking on the mountain top; in the valley.

FIFTH MONTH.

Food—What is food? Take whole milk to show classes of food principles. Cream, fat. Remove cream, heat milk; curd is one form of protein. The whey contains the sugar of milk. Put flour in little pieces of cloth; wash out starch; the gluten left on cloth is another form of protein. The lean part of meat is another form of protein.

Food principles. Protein—Fat. Carbohydrates.

These food principles are found in our ordinary foods. Food must be digested before it can be used in the body to build tissues, make muscle or fat, or keep the body warm. The various processes of cooking should aid digestion by the action of heat upon the different food principles.

SIXTH MONTH.

Vegetables—Show that many different parts of plants are used for food. Seeds—Peas, beans. Roots—Carrots, turnips. Bulb—Onions. Tubers—Potatoes. Shoots—Asparagus. Stalks—Celery, rhubarb. Leaves—Cabbage, lettuce. Flower—Cauliflower. Fruit—Cucumber, tomato.

Value of vegetables and fruits in the diet to add certain acids and mineral matters to the food.

SEVENTH MONTH.

Bread—Tell something of history of bread making; show samples of grains from which flour is made. Try to get gluten from corn meal. Try to get gluten from oat meal. Explain processes in bread making. Mixing—Care in measuring materials and neatness. Kneading—Reasons for; how to tell when kneaded enough; emphasize cleanliness of person and untensils. Raising—Reason for; temerature; time dependent on quantity of yeast. Baking—Size of loaf; small ones better; why? Temperature of oven; how to tell when hot enough; effect of heat in baking; importance of having bread well baked. Have child to make bread according to directions and bring small loaf to school. Explain changes in bread in making toast. Talk about use of whole wheat and Graham bread. How to avoid sour, heavy bread.

EIGHTH MONTH.

Meats—Look at pictures of animals used for food. Ask child what kind of meat he likes best. Discuss different methods of cooking. Show that in boiling, roasting, broiling the aim is to retain all the juices. So sear the outside as quickly as possible. In soup making, aim to draw out all the juices. Soak in cold water. Squeeze juice out of meat; heat juice. Explain what happens. Put 2 inches of cubic meat into boiling water; explain the result.

Get charts of different animals. Talk about different cuts of meat, their cost and food value. Explain terms: "Trimmings," "refuse," "waste." Show why pork should be well cooked. Show how to use left-over pieces of meat. Discuss methods of preserving meats.

The body is made up of the same principles as food, viz: Proteids, fats, and carbohydrates—so it is built up by the food we eat.

Ought to be careful to select food that contains these different principles; to cook it well; to serve it daintily, and to be careful to have everything very clean.

A suitable text-book on sewing and one on cooking should be in the hands of the teacher.

APPENDIX C.

PAPERS READ AT COUNTY FARMERS' INSTITUTES.

(By Henry Bird, Jr., Lockport. Read Jan. 17, 1903.)

"The Best Fruits for Will County, and Their Cultivation," is the topic assigned me by your executive committee.

My paper will have one merit, it is short.

First, I want to say that I have lived in Will county only a comparatively short time, and another thing, I am not the man that never makes a mistake. Therefore I may do and say things that I would not do with more experience here. So far, I would not do any different if I had it all to do over again.

I am and always have been a tree planter and expect to keep at it as long as I live. I have set liberally of all kinds of fruits and some of them have more than met my expectations. My business takes me to all parts of the county, and I shall give you some things outside of my experience, that I have seen and heard.

Almost everywhere that I go, I find some fruits that are doing well. Here and there I find an old tree that is almost a wonder of fruitfulness and vigor, and still seemingly very unfavorably situated, as are most of the trees and orchards that I have seen. I have yet to see the first well cared for and cultivated orchard in Will county. There are such I presume, as I have heard of some. All that I have seen, are either in pasture or stiff sod, receiving neither care nor fertilizer of any kind, and still expected to give big crops of good fruit, which they sometimes do, starved and untrimmed as they are. I hear people say that this is not a fruit country. I think now that as good fruit and as much of it can be raised in Will county as anywhere. Not all the tender varieties of course, but very much more than you think. Everywhere I find a few peach trees, most of them raised where they stand from the seed, and many of them bearing splendid fruit that will compare favorably with that raised anywhere. In fact, the best peach that I ever ate grew in Will county. You have all seen such peaches grown on your own or your neighbor's farms, and the peach is one of the tenderest fruits raised in northern Illinois. I would not recommend the planting of large orchards, as we can expect peaches only about once in three years. But it will pay to plant ten or a dozen to start with, and a few every year after to keep just enough to have all that you can use once in a while.

But I am getting ahead of my story. You ask what are the best fruits for Will county, as I think of it, I think that they are all best. But if you want to know which will pay best, I would say apples, pears, cherries, plums, grapes and most of the small fruits. Years ago, it was no trouble to raise all the apples that you wanted and have plenty to spare. Then we knew nothing of varieties suited to our climate and conditions, but planted such as our folks down east had. Some kinds did very well here, but more of them were worse than worthless.

A short time ago. I was talking with an old gentleman who told me that he planted an orchard of several acres and that not one-half of them ever did anything. Those of them that did bear, sent his two boys through school, college and medical college, a course of about 11 years for each of them. They are both of them splendid men and ornaments to their profession. One is one of the solid men in Michigan, the other, a citizen of Joliet. That is good fruit for Will county and they will never be ashamed of it.

Can you send two of your boys through 11 years of school with any crop that you can raise on two or three acres of your farm? I think not, except it be a fruit crop some of them might do it. Wherever I find a young orchard of the new varieties such as Duchess, Wealthy, Transparent, Pewaukee, and half a dozen others, I find them full of good fruit, as nice apples as you can ask for, and a man that almost invariably wants some more of them.

Pears come next, and I don't know but I ought to say first in importance, as they certainly do well here, and but for blight, would unquestionably be a better fruit to raise than the apple.

Last spring I met a nice old gentleman who had heard that I had planted a nice pear orchard. He stopped me on the street saying, "Mr. Bird, how are your pears?" I told him they were doing nicely—when he told me that I must get all the pleasure out of them that I could as they would not last long. He told me that he planted, I think, 50 pear trees, 40 odd years ago and that there were only nine of them left I asked if they were doing anything now, and was told that he got from five to ten bushels per tree from them each year or about $50 a year from nine old scrubby pear trees standing in a pasture or lane. I asked why he had not put in new trees as the old ones died out or at least nine more so as to make it $100 a year. His answer was, "I don't know." Must have thought that it was not worth while. But just the same, he had no crop on ten times the amount of land that paid one-half as much, unless it was grapes and he had wagon loads of them.

His trees are not the only old ones. I find in every neighborhood trees that are producing ten to 15 bushels of first-class fruit. These old trees are most of them Flemish Beauties, a good pear.

Among the younger trees and newer varieties the Keiffer is a good grower, bears young and keeps it up.

Among those recommended by our State Horticulturists is the Sudduth, a pear that has never blighted or winter killed. I think that it is the coming pear for us and will be generally planted as soon as we see it tested and know its good qualities for ourselves. I have eaten it canned and it was delicious. I think that Mr. Augustine will tell you that I liked it, as when he opened can of them for me to taste, I tasted and kept tasting them until every pear in that can was gone before I had tasted them to my satisfaction. I will be perfectly satisfied with the Sudduth if it is one-half as good to eat out of hand as it is canned. At any rate, I liked it well enough so that I planted 125 of them on my farm and planted them when they cost $2 per tree.

I do not need to tell you that cherries do well here, at least the sour varieties, such as Early Richmond, Dye House, Wragg, Montmorency and English Morello.

We all know how hard it is to get even a few to can, and everybody wants a few cans of cherries, and the youngsters want more than a few cans to eat out of hand. Every year men, women and children come from town looking for a chance to buy some cherries, and will pay almost any price for the privilege of picking the cherries for themselves.

One of my neighbors has made a practice of selling his cherries on the trees to parties from Joliet, Lockport and Lemont. They come from every direction. All his trouble was that he had not half as many trees as customers, and now he has less, as we had a small cyclone or tornado that blew down most of his trees. Of course he has planted a lot of new ones, but it takes time and care to raise trees. All his trees were Early Richmond, but now he has planted other varieties, and in a few years he will have cherries for all his customers, old and new. I think that any farmer within eight to ten miles from Joilet, that will set out 100 or more trees and care for them, can send his boy to college and pay his expenses entirely from those trees.

I know of one man that took $300 from less than half an acre of cherry trees, and I know of five Early Richmond cherry trees that paid their owner $45 the past season.

What better investment can you ask for? Who would not give room and care to trees that will pay so well, to say nothing of the enjoyment of having enough for your own use?

Plums I don't know much about, but I cannot see why they won't do as well as either apples, pears or cherries. I find but few of them in the county, but I do find some of them that are producing good crops of fine fruit, and that without the least care. I also find a good many wild ones that often produce crops of nice plums.

In Michigan, where they raise plums, you could not get a plum, wild or tame, without spraying or jarring. If we can find them here, grown without care, I can see no reason why, with proper care, we can't get as many and as good plums as they can. Our State horticulturists recommend first the native varieties, then the hardier of the European or Japan plums. I expect to know more about plums in a few years, as my orchard will soon be in bearing. I have planted all kinds—native, European and Japan.

Grapes do as well here as in any place not strictly a grape country. There are a few small sections where they do wonders, as on Kelly's Island, in Lake Erie and around Lawton and Paw Paw in Michigan. Aside from these small sections, I can't see but that they do as well here as anywhere. Not all the tender varieties, but those suited to our climate, such as the Concord, Worden, Moore's Early and Niagara. They are easily raised and do well in any corner on the side of the barn or sheds, cover unsightly buildings, and in fact, anywhere that they can get off from the ground, and they seldom fail to pay well for all the care that they get.

Among the small fruits, the currants are my favorite. I know that they pay as I have an acre of them that have paid from the first year that they were planted. The first year they paid $20.00. The second year they paid $100.00, and the third year, (last season) they paid $300.00. I am sure that they can be classed as one of the best fruits for Will county. If there is anything that will pay any better, I should like to know what it is as I want to try it.

Gooseberries I think will pay just as well and are just as easily raised. I have 175 bushes that are 2 years old that paid me $23.00 besides what we used, and we used about four bushels.

Of raspberries, we have only a few, just what we want for our own use, and we picked about eight bushels of them. They were good this year as were the blackberries. Blackberries are not always a success. They can't be depended on as they come in the hottest and driest part of the year and are apt to dry up after the first few pickings. Still I think that they have paid us, and paid us well for all the time spent caring for them. All my experience is with the Snyder.

All the strawberries that I have raised in Illinois have cost me at least 20 to 25 cents per quart, until last season, when I took 67 crates off from a little patch of less than one-third of an acre, and all good berries. That paid. So far in my experience here, there are too many hot, dry days for them. Usually a few of the earlier ones for the first picking are fairly good. The remainder of them are small poor things, buttons, as the strawberry men call them. Still we think that it pays to have a small patch of them.

I often hear some one say that I can buy my fruit cheaper than I can raise it. Do you think that he does: What he gets may not cost him as much, but what he does get is not one-tenth of what they would use if they grew it themselves, and not as good, to say nothing of having it at home when wanted, and there is a pleasure and comfort in it not to be out of what you buy. I like to think that I raised it myself. Cherries taste much better to the boy that can pick them and so does any fruit to anyone.

About the cultivation. Get everything in good long rows where the horse can do the work. Then the work in the garden and orchard would not be such a terror to you. I know from experience. I don't blame the man for dreading the thought of it, whose garden and orchard is so arranged and fenced that all the work must be done with spade and hoe. The hoe is all right, but not where a horse can do the work.

Any one who can cultivate and care for corn, can care for and cultivate fruit.

It is good deal like a girl on a visit whose mother was a famous bread-maker. The girl's friends insisted on her making some of her mother's nice bread. She told them that she knew how it was made, knew every ingredient that went into it; in fact, she knew all about it, but her mother stirred in lots of judgment.

It is somewhat so in the care and cultivation of fruit. Just stir in a little judgment.

Maintenance on Earth Roads.

(By Ira O. Baker, M. Am. Soc., C. E. Prof., of Civil Engineering University of Illinois, and Author of a Treatise on Roads and Pavements. Read before the Champaign County Institute at Philo, Illinois, Sept. 23, 1902.)

In the last ten or twelve years a large amount of literature has been set afloat in newspapers, magazines and reports upon the subject of road improvement, but investigation will show that only a comparatively few people believe in the views presented; and those who would be expected to know most about the roads and also those who use them most are least ready to assent to the views thus presented. To many people this state of affairs is confusing, and many therefore turn a deaf ear to all suggestions concerning road improvement, while to not a few the subject of roads is as a red rag to a bull. As a preliminary to my subject tonight, and as a means of clearing up some of the confusion, I beg that you will permit me briefly to call attention to some facts concerning the source and purpose of much of the current literature on good roads.

About ten or twelve years ago, two or three well organized manufacturing interests, to increase the sale of their goods, deliberately started an agitation for better roads, and unfortunately committed the conduct of the scheme to those who knew little or nothing about either road construction or the larger principles of economics and political action involved in any comprehensive system of road improvement. The interests back of this propaganda were very skillful in arousing the enthusiasm of their followers, who were both numerous and widely distributed, and an attempt was made to carry by storm a reform system of constructing and maintaining the roads of the nation. Many politicians and newspapers sought to secure public favor by favoring the proposed resolution, and as a consequence wide circulation has been given to certain facts and theories which in their proper field were true, but which when presented without limitation were wholly false and entirely misleading.

These intemperate advocates of road reform have frequently cited the wagon roads of England, France and Switzerland as examples of what the United States could and should do, regardless of the fact that those countries are abundantly supplied with good road-building materials, while in this country there are areas greater than the combined area of those countries in which there is absolutely no road building material. Again, the stone wagon roads in those countries were built under the stimulus of military necessity and commercial need, before the advent of steam railroads, while in the greater part of this country the railroads have been the pioneers, and now there is no commercial need of long lines of wagon transportation, except perhaps in the immediate vicinity of large cities. Further, the density of population, the industrial occupation, the agricultural methods are very different in those countries from the methods prevailing in this. Still again, the methods employed in maintaining wagon roads in those countries, with their dense and poorly-paid population, is no criterion by which to judge what is wise or possible in this country. And onee more, the political and social ideals on the two sides of the Atlantic are very different, and make possible certain results in Europe which are absolutely impossible in this country. Finally, the best-built stone roads in America are vastly superior to any in the Old World. The limitations of high-priced hand labor have compelled American engineers to utilize machinery, if they are to construct stone roads at all, and as a consequence there has been developed in this country a system of stone road building that gives cheaper and better results than the much-vaunted European roads. Therefore he who seeks to improve American roads must study American conditions; or, better, he who seeks to improve the wagon roads of a particular locality must study the local conditions.

Almost, if not absolutely, universally in this country the administration of road affairs is in the hands of small local boards, which, from the nature of our form of government, are liable to change frequently. This condition imposes a well-nigh insurmountable limitation upon any comprehensive and continuous system of road improvement, unless the public generally firmly believes in the value of the proposed system. Therefore it is highly important that correct information concerning road economics, road administration and road construction should be widely disseminated.

Again, these enthusiasts frequently cite the experience of localities in Long Island and New Jersey, within a few miles of New York City, as though they were representative of rural roads in general. New York is the largest and wealthiest city on this continent, and it is not to be wondered at that the building of good roads is one means of enticing people to move from the densely populated districts of the city into the more healthful suburban regions, and that the influx of such inhabitants has greatly increased the value of real estate; but not all of the United States is not situated in the bedroom of New York City. Some years ago the annual report of the state highway commissioners of New Jersey contained an interesting account of road improvement in Gloucester county, which has been very widely copied and commended; but when it is known that this county is just across the river from Philadelphia, and that the soil is very sandy and the road improvement simply enabled truck farmers to wagon their produce to market, it is seen that this example has but little practical bearing upon the general question of rural road improvement. Again, along the eastern shore of New Jersey is a continuous line of summer resorts, where people of wealth go to enjoy themselves, and it is doubtless a good business proposition for such communities to build first-class stone roads for the pleasure of their profitable guests; but their success does not prove that a truly rural community should follow their example and also build expensive roads. The primary fault of most road reformers has been that, through dense ignorance or superficial knowledge or intention, they have presented facts, separate and apart from their limitive conditions, in such a way that the truth becomes a falsehood.

This recent ill-advised and intemperate road agitation has in many cases done harm, since a form of road construction has been advocated that, under most conditions, has been entirely impracticable, if not ridiculous; and the result has been that those who are most interested in good roads have been most concerned to prevent road construction and maintenance being made subservient to interests foreign to those who chiefly use the roads and also pay for them; and, as a result of this condition of affairs, the improvement of local roads has not received the attention recently that its importance warrants, and it is probable that road improvement has not kept pace the past ten years with the industrial development in other lines. It is freely admitted that the roads in Central Illinois have been very greatly improved in the last 25 years; but I firmly believe that they can be improved further without material expense by attention to a few minor details. Before I attempt to show how I think this can be done, permit me to explain how I think in cannot be accomplished.

In the first place, it is probable that no important and lasting improvement in road matters can be secured by legal enactment—either State, county or township—except where the laws are supported by an intelligent and active public sentiment. Numerous examples could be cited where the higher legislative authorities have passed laws to be enforced by the local authorities which have rested in entire desuetude. The dominating spirit of our system of government is home rule, in road matters as well as other things; and the local community is not likely to relinquish the rights it has long exercised until the public is convinced that by so doing it is not falling from the frying-pan into the fire.

In the second place, I do not believe that the roads would be better cared for if they were done by men who gave all their time to that work. This plan has some promising advantages, and is probably a necessity for the maintenance of first-class broken stone roads, having any considerable amount of travel; but it is impracticable for truly rural roads, whether of broken stone or earth. The amount of labor required is so small that the care-taker would have so great a length under his charge that he could not visit each section only at comparatively long intervals; and, therefore, could not become intimately acquainted with the road and could not do the work at the most favorable time.

In the third place, I do not believe that the roads would on the whole be much if any better if the read taxes were paid in cash instead of labor. It is unquestionably true that often a farmer does not work with as much energy when paying his labor road tax as when working in his own field; but it is equally true that no man works for the public with as much energy as for himself. Road reformers must recognize that human nature will manifest itself very much the same in road affairs as in other matters of life. It is not proven that changing from the labor tax to the cash tax system would not be going from bad to warse. Notice first that the disease is not as serious as charged, many farmers giving even more labor than is expected. Again, road taxes are in effect assessed by farmers, and paid by farmers; and farmers would probably rather pay two dollars in labor than one in cash. Further, the officials that permit inefficiency under the labor tax system, will probably permit equal inefficiency under the cash tax system. There are some minor features of the labor vs. the cash tax question that are worthy of consideration, but space is not here available. City streets are maintained on the cash tax system. Are they better or more economically cared for than the country roads? The writer has has had a wide opportunity to compare the conditions in six or eight counties of Illinois, and also in a few other localities in other states, and his observation is that the streets of the village and small cities are not as well cared for as the roads in the surrounding country. Further, the writer is of the opinion that, as a rule, the streets of even the large cities are not as well nor as economically cared for as the rural highways. There would be some justice in arguing that this condition was proof that the cash tax system was not as efficient as the labor tax system; but the writer does not so regard it, since there are more important conditions that control in the management of both city streets and country roads. When there is a leak in the roof, it is foolish to argue whether another coat of whitewash or some new wall paper will remove the spot on the ceiling The difference between the labor and the cash tax has but little to do with the condition or cost of the roads. The writer has repeatedly seen excellent roads under each system, and immediately adjoining has seen very poor ones under both systems.

The chief defect in the construction and maintenance of American highways is the lack of intelligent and effective supervision. We shall never have intelligent supervision until there is worked out for each locality a system of rules, either traditional or printed, for the care and improvement of the public highways; and we shall never secure effective supervision until the public generally comes to believe in better highways.

My plea tonight is that those present shall deliberately set about seeing what can be done to work out the road problem in each community and particularly in Philo township. As before stated, I believe that the roads can be materially improved without much, if any, expense. Before explaining how I think this may be done permit me to cite an example of the method to be employed.

American bridge engineering easily leads the world. Many of you have doubtless read in the magazines within a year or two, how a Philadelphia firm of bridge builders obtained a contract from the British government for a large bridge across the Upper Nile in the wilds of Africa at about two-thirds of the price and completed the bridge in about one third of the time required by the lowest European builders. If time would permit I am sure you would be interested in the story of this industrial triumph of our countrymen; and this is only one of many such examples. How was this result accomplished; or rather, to what is this American success due? Europe has an abundance of iron and steel, has many excellent machine shops, and has plenty of cheap labor, and besides has been building iron bridges for twice as long a time as America. How then, has youth outrun age? In brief, America's success was due almost wholly to competition in design. In Europe it is the universal practice when a new bridge is required, for an engineer to make the design and then let the contract for its construction to some firm at a certain price per pound. If the designer uses more metal than is necessary, or if he requires the work to be done in an uneconomical way, it does not matter how cheaply the manufacturer works, the bridge will be an expensive one. The only opportunity for the manfacturer to exercise his ingenuity and skill is in reducing the cost of manufacture. In America, when a new bridge is required, a manufacturer submits a design and proposes to build the bridge complete for a lump sum; and therefore if he can make one pound of metal do as much work as the European's two, and puts the several pieces together so as to economize shop work, it adds to his profits or enables him to do the work cheaper than his competitor. America has come to this position of supremacy in industrial affairs chiefly through competition in design and division of labor. My purpose tonight is to beg you to introduce these principles into the care of our earth roads. Or to be more exact, I plead for competition in design and individual responsibility in the care of our roads.

To secure this, divide the roads up and allot definite sections to farmers and publish these allotments. As far as possible, require each man to care for the road nearest home and which he travels most. One man will probably care for his section in one way and another man in some other way, and thus will come into play competition of design and finally there will be evolved the best way of doing the work. It is entirely feasible to have annual competitions with inspections and the award of prizes and diplomas. Railroads find annual inspections and nominal cash prizes exceedingly effective. Why not try then in highway work?

I have another recommendation, which is: Depend less upon the ordinary road machine for the care of the roads. As I have gone about over this and adjoining counties on bridge business the past ten years, I have seen many examples of the effective use of a railroad rail or a wooden scraper in leveling the roads. Either of these devices is cheaper, lighter and easier to handle than the four wheeled grader, but to be effective it must be used earlier in the spring. You can go over a road several times with a railroad rail or a harrow as cheaply as once with the grader. These tools can be used much earlier than the grader, and thus hasten the coming of good smooth roads and also decrease the labor required with the road machine. It is astonishing how much good can be done by going over the road with a railroad rail or a harrow just as the frost is going out of the ground.

For several years I have noticed that the roads of Bement township are unusually good, particularly early in the spring, and this notwithstanding they have a very sticky soil. The good quality of these roads is due to the frequent use of the railroad rail just as the frost is going out. One round in the middle of the road is all that is needed, and two teams walk right along, so that the work is not very expensive. This smoothing of the surface fills up the holes and sheds the water to the side ditches and prevents the roads from ever becoming very bad, and also decreases the labor and time required with the scraping grader later.

A third suggestion: As I have gone about over this and adjoining counties I have been forcibly struck with the great difference in the way different men handle the road grader. Some will nearly pull the life out of their horses and do little or no good, while others will make lighter work of it and do more good to the roads. The road machine is a complicated tool, but when properly used it will greatly benefit the roads. Why not have competitive contests to determine the best method of using this excellent tool and to disseminate this knowledge?

There are several ways in which our roads may be improved with almost no expense, which perhaps do not even require mentioning here, for when any man starts out to study the roads to see what they need he can see these defects with half an eye. For example, it improves a road on a steep grade and also saves expense, to keep it rounded up so as to shed the water into the side ditches instead of permitting it to run down the middle of the road. Second, wherever water stands at the side of the road, better drainage is needed—either an open ditch or a line of tile, or an inlet into the tile already laid. Third, it is poor economy to make small culverts, say a wooden box one foot square, so short as to concentrate travel and wear a mud hole on both sides of it. Fourth, after a long muddy spell when a cold wave has been announced, if the road is dragged a smooth hard track will result. The drag can be made by splitting a 10 inch round log lengthwise and fastening the two pieces together by nailing cleats on the flat sides, the two logs being about 2 feet apart. This device is to be dragged over the roads round sides down. Time does not permit a further discussion of minor details of road improvement.

In conclusion permit me to summarize what has been said.

1. Experience in road building in Europe or in New Jersey is no guide for Illinois, since the road question is a problem to be solved by each local community for itself.

2. It is not reasonable to expect any material improvement in the condition of the roads simply by changing from the labor-tax to the cash-tax system or vice versa.

3. To secure individual responsibility and stimulate personal pride, assign the care of definite sections of road to individual farmers; and publish the assignments, and award prizes or diplomas for excellence.

4. The harrow or the wooden scraper or the railroad rail should be used more than at present.

5. Competitions in operating the road grader would develop the best method of handling that machine.

6. The proper care of our earth roads is worthy the thought of any and all who dwell in the country.

7. An intelligent and active public interest in road affairs will secure greater efficiency in all kinds of road work.

RAPE AS A FORAGE CROP.

The following article was read by A. B. Puterbaugh, of Milledgeville, at the Carroll County Farmers' Institute held at Milledgeville, Jan. 13 and 14, 1903:

No doubt few forage plants are as little known as rape. Though as yet grown in but a limited way rape is rapidly gaining favor in this country, mainly through the instrumentality of our experiment stations which have brought it prominently to the attention of stockmen.

The Dwarf Essex is the variety commonly sown and the only variety I would advise. Rape may be sown at any time from early spring until August, in the northern states, the seed being scattered at the rate of three or four pounds to the acre broadcast, or two or three pounds to the acre in drills about 30 inches apart. The crop is harvested by turning stock directly into the rape fields to consume the abundant, nutricious leaves and stems, which are the parts eaten. It cannot be utilized to advantage as a dry forage, nor as silage, owing to its large water contents.

Rape has been known to yield 27 tons per acre from two pounds of seed sown in drills 27 inches apart, and cultivated every ten days. At the Wisconsin experiment station they report a yield of 9¾ tons of rape at a single cutting from a half an acre of land, while a small plat yielded at the rate of 36 tons per acre from two cuttings.

For cattle, rape is highly prized by some feeders for furnishing a succulent feed during the fall months and preparing them for winter.

It has also been fed to dairy cows, but must be fed with caution, lest it taint the milk. It is on sheep farms that rape will find its largest use. It can be fed to all classes of sheep with advantage, and, since the animals harvest the crop themselves, the cost of feeding it is insignificant compared with the returns. Within eight weeks after seeding the plants is large enough for use, and it is fed off by turning the sheep directly into the field to gather the forage at will. The attempt should never be made to feed lambs rape without giving them a couple of hours' grazing on pasture before turning them into the rape. This is necessary for the safety of the lambs, as they are otherwise liable to bloat, and the combined feeding on pasture and rape result in greater gains.

The rape crop, which will probably grow anywhere in the United States at some season of the year, is recommended to farmers and stockmen as well worthy of trial, since it is produced at small expense for the seed and culture, and yields an immense amount of nutritious forage, the flavor and succulence of which are highly appreciated by cattle, sheep and swine.

At the Wisconsin station Mr. Craig studied the influence of rape forage and blue-grass pasture in the fattening of lambs. A bunch of 96 grade Shropshire lambs from Northern Wisconsin was divided into two lots of 48 each, one grazing on blue-grass pasture and the other hurdled on a rape field. In addition to this feed, they were supplied a grain mixture of equal parts of peas and corn, by weight.

The lambs were fed on pasture or rape for four weeks, after which they were placed in feeding pens and the grain ration increased. During the preliminary feeding of four weeks the 48 lambs on the rape pasture consumed .64 acres of rape, gaining 50 per cent more in weight than the lot on blue grass pasture.

During the four weeks' preliminary feeding the lambs on rape with some grain gained 2.6 pounds per head weekly, while those on blue grass gained but 1.7 pounds. During the twelve weeks' fattening which followed the preliminary period just described the rape-fed lambs gained 20 pounds, while those on blue-grass pasture gained 18 pounds. The amount of grain required for 100 pounds of gain was also less with the lambs previously fed on rape.

In another test at the same station two trials were made with rape forage as a feed for swine in preparation for the final fattening period. In the first trial there were 20 grade Poland China pigs; in the second 38 grade Chester White. In each case the pigs were divided into two even lots, the first having a run in a rape field, with grain additional, and the second, confined in a pen, receiving grain only. The first trial lasted 76 days and the second 42 days, during which time the feed consumed and grain were as follows: Lot 1, in rape field, had 1,386 pounds of corn and 690 pound of middlings and .32 acres rape, and gained 853 pounds. Lot 2, in pen, had 2,096 pounds of corn and 1,042 pounds of middlings, and gained 857 pounds.

Second trial: Lot 1, in rape field, had 2,220 pounds of corn and 1,109 pounds of middlings 6 10 acres of rape, and gained 1,066 pounds. Lot 2, in pen, had 3,106 pounds of corn and 1,553 pounds of middlings, and gained 1,076 pounds.

Summarizing the two trials, and calling the grain equal, we learn that .92 acres of rape save 2,392 pounds of grain. This shows one acre of rape equivalent to 2,600 pounds of grain, or one acre of rape equivalent to 43 bushels of corn.

My first experience in sowing rape was in 1896 when I sowed six acres in my corn field just before the last cultivation. I secured a good stand and an immense crop. I believe 15 to 18 tons per acre of feed grew on this. I turned in a bunch of lambs, and was so well pleased with the result, that the following year I sowed rape in 25 acres of corn in the same way, and again I secured a splendid stand, sowing about four pounds of rape seed to the acre. On June 19 I bought in Chicago 1,160 Mexican yearling sheep weighing in Chicago 64,480 pounds at a cost of $2,280.68. These sheep were turned on blue grass pasture for a while, but as soon as I thought advisable I turned them in the corn and rape, leaving them in but 20 minutes the first day and gradually increasing the time from day to day, leaving them in all the time as soon as they became accustomed to the feed, and I thought it safe. This bunch of sheep, much different form any other bunch I ever fed, started at the gate and ate everything as they went, rape, corn, husks, blades, in fact, everything but the corn stalks and cobs. On August 25th I shipped 286 of these sheep, that weighed 20,370 pounds but found that they were not good enough for the best price, and I kept the balance on the rape until September 23d. I again shipped one double deck car containing 267 head. This time they were pronounced good and sold for a very satisfactory price. The quality of the sheep were such that the packers wanted them and afterwards lead to the sale of the balance, at home, to one of the leading packers and they were shipped October 13. As I already stated these sheep weighed in Chicago when purchased 64,480 and cost $2,280.68 and again weighed in Chicago when shipped back 90,210 pounds and sold for $4,059.58, gaining 25,730 pounds in weight and $1,778.90 in value.

At this time there was about three acres of corn and rape left. Giving the corn and rape field credit for all the gain, you see I sold the product of this field for $1,778.90. equal to $80.90 per acre.

Perhaps this would not be quite fair to give this field credit for the full amount of gain as the sheep were run on blue grass pasture previous to the time they were turned into the rape. Giving the corn and rape field credit for 75 per cent of the profit, gives me over $60 per acre. Within 12 months from the time I commenced to feed this bunch of sheep, I fed 5,000 sheep, between 700 and 800 hogs and 200 cattle on the farm, which but a few years before this, I bought for $16,000.

While this stock was not all fed on rape, it was on just as cheap a feed as rape, and this year's feeding above all expenses paid over one-half the purchase price of this farm, yet we still have men who contend there is no money in farming. There has been scarcely a year since this time, that I have not sown from 25 to 75 acres of rape in my corn. This year I had on two of my farms about 100 acres.

I have on hand now about 1,300 sheep, which were run the earlier part of the season on rape. The following was taken from the Daily Live Stock Report, dated Dec. 8, 1902:

"Armour & Co. bought a double deck of fancy Christmas wethers, weighing 135 pounds at $4.40, this being 15 cents per hundred higher than anything sold the same day." The sheep referred to were a bunch I bought in Chicago in July and were fattened mostly on rape and blue grass with but very little grain at the finish. I believe that a car of these sheep were good enough to have been put in the Fat Stock Show. I would by all means advise farmers to sow some rape in corn where cattle are to be turned in the stalks. If the season is favorable it will produce an abundance feed for the cattle, and it is my opinion that if this were done there would be no trouble with the much dreaded corn stalk disease.

Some advocate sowing rape with the oats for fall seed. Two years ago, while near Lanark, I was urged to go out and see a 40 acre field of rape which was sowed in this way. I think it was about the first of September. I believe the rape stood about three feet high, and had made a splendid growth after the oats were cut. The same year I sowed about 15 acres the same way, and, while this was perhaps the dryest season known for years, I had a very good crop. While this may do some years, I do not think it a safe thing to do. Imagine rape being sown this year, and the oats laying flat on the ground and the rape growing two or three feet high above it.

I would urge every farmer to sow the vacant lots which are around every farm yard with rape for the brood sows and their pigs and for the calves. I would much rather have rape growing in my corn-fields than weeds. The worst and only objection I see in sowing rape in corn is that it makes husking the corn on mornings when there is a heavy dew very disagreeable, as it is very wet if you succeed in getting a good growth of rape. Start with sowing a few acres at first. My first experience was with six acres.

Discussion of the above paper brought out these facts: Mr. Puterbaugh's figures are authentic, being taken from his books. The sheep were bought in Chicago at an unusually low figure, and were so free from disease that not one of them died. The same number of sheep that were bought there were returned and sold. While it was an extraordinary transaction, it is not out of the range of possibility, for it actually occurred as stated. While like prices may not soon prevail again, the benefits of rape as a forage crop will remain the same.

Listing Corn.

(Paper read before Sangamon County Farmers' Institute at Williamsville, Ill., Oct. 15, 1902, by Leigh F. Maxey, of Pasfield, Ill., upon the subject of "Listing Corn.")

In this immediate locality the lister was used about fifteen years ago by a farmer living near Bates, Illinois. From this one farm it has spread until probably one-third to one-half of the corn crop within a radius of twenty miles is planted in this way; and it is from this limited area that I have an opportunity to study the subject at hand.

A lister, as all persons who have ever seen one know, is a double moleboard plow which throws the soil outward each way from the center, instead of one way, as does an ordinary breaking plow, and makes, or leaves, a complete furrow for a row of corn each time it is driven through a field.

The corn is drilled in with an attachment fitted to the rear of the lister, at the same time the furrow is made.

This is really the orthodox way of using the lister, but few follow this practice here; at least, after they have had experience. The most successful way has proved to be that of listing the land, using only the subsoiler or plow for making the furrows, then using an ordinary corn planter to plant the corn, making two distinct operations.

The use of the planter in this way insures a more even germination of the seed than when drilled in with the lister at the same time of making the furrow.

I have no doubt that this is because the wheels of the corn planter firm the soil over each hill just alike. If the corn could not be planted in this way, I feel almost certain that, as a general rule, the lister would not prove successful in our black Illinois soils. Manufacturers are making a sulky lister with a wheel similar to a planter wheel, which follows behind in the furrows, breaking the weight of the entire implement, which is intended to perform the same duty as a planter wheel. But I am not certain that is the thing we need as yet, because I feel sure that it will not always form the best practice to plant at time of listing. Also, the sulky listers are much more expensive than the walking implement, and, with the limited knowledge which we have as to the ultimate success of the practice, we do not want to purchase an implement that we might have to throw away. There are several ways of listing. By listing once, a portion of the soil between each row is not stirred, but is simply covered with loose soil from three to five inches deep. Later in the season, when the loose soil is plowed back into the furrow, the last cultivation or perhaps two are done witn the cultivators running in this previously unstirred soil. This is very hard upon plows and teams if the season be dry. To overcome this, some farmers list their corn land twice, the second time throwing out the ridges previously made. This also has its objections. The principal one is that the first listing, by throwing loose soil upon that which is unstirred, acts as a mulch and prevents evaporation. The result is that when the ridge is thrown out at the second listing the soil from lower part of furrow turns up quite moist, sometimes even sticky, and becomes cloddy as it dries. The sun has not penetrated to the depths of the former ridge, so at this second listing we have a cold seed bed containing excessive moisture, so it is several hours, and perhaps days, before we have a most favorable condition for the germinating process to go on. This time is lost. Too many go ahead, however, and plant the seed at once, not understanding this lane of soil moisture, and then wonder at a poor stand and slow growth in the young corn plants. Still other successful corn growers plow their ground shallow early in the spring, then list ahead of planter and have the advantage of both plowing and listing, but this is a very expensive way of doing things, although in the season of 1901 corn grown in this way yielded by actual weight two and a half to five bushels per acre more than any other of the several methods employed in my experimental work.

None of the methods I have tried are entirely satisfactory, so this year (1902) we disc-harrowed over our corn ground, cutting it thoroughly to a depth of two or three inches, then listed and planted with a corn planter.

The advantages of listing are that corn does not blow down should high winds prevail, or insect pests destroy the root of the plant.

The corn does not suffer so soon from dry weather.

These are the two strongest arguments in favor of the lister.

A minor advantage is the rapidity of planting, which is a great advantage in some cases, and certain circumstances, as all know.

The most vexing objection to listing becomes apparent if, after planting and before the young plants have appeared a heavy rain results in a crust through which the young plants are not able to break.

This crust always forms to a harder degree than that which forms upon the surface of the ordinarily prepared field, and, while the crust upon the surface planting can be broken with a smoothing harrow, this is impossible in a listed furrow, and many acres of corn have been replanted in this locality for this one cause alone. However, we can take a short piece of thick board and fill it with spike nails and fasten two or three of these pieces behind a light drag, so that they will drag endways in the furrow, and your crust is broken. Short pieces of logs or barrels answer the same purpose, if work is done before, and if the corn has appeared above ground.

CULTIVATING LISTED CORN.

After the corn is planted we begin to work our ridges by rolling them on top with a straight roller having fastened two barrels behind it containing a little dirt for weight. The object for using barrels in this way is to work down the sides of the furrows, or the barrels may be hitched behind a light drag and practically the same results are obtained. Some make what is termed a goose-egg roller, and roll each ridge and furrow at the same time. After this rolling and dragging process the ridge should be firmed on each side and top, although the ridges may be, and I do myself sometimes only roll the top, and do nothing at all to the sides. A harrow is used now, even when the corn is quite small, and sometimes it is found to do very efficient work by going over the field two and even three times before cultivation is begun. Although my practice is to usually harrow but once, and then begin cultivation as soon as possible. This can be done with an ordinary cultivator, using any shovels, and fenders which work well on surface planted corn. The corn can be planted just as easily in a furrow as on the surface, and the weeds more effectively destroyed, if the ridges have previously been properly prepared. I like to check the listed corn and cultivate crosswise one time, as I think it leaves a more efficient mulch upon the surface when cultivation has been discontinued. Also, check corn comes up stronger and seems to have a better show in case of unfavorable conditions. Listed corn does not keep pace with surface planted corn in growth until about the time the furrows are filled up level from cultivation. After this there is no apparent difference in the rate of growth. The only reason I can give for this is that the corn does not reach with its full force the depth of the roots until this ridge has been worked down. I do not know this to be a fact; it is only my supposition, and some of our scientific friends may have the cause and effect of this matter already figured out. Listed corn also matures eight to 14 days later than surface planted corn—due largely, I think, to the retarded growth during the early part of the season just mentioned. I now see no way to remedy or overcome this fact. In one test I made with listed and surface corn I found that between Nov. 1, 1901, date of beginning husking, and Dec. 15, 1901, date at which husking of the crop was finished, the listed corn showed a shrinkage of 13 per cent, while the surface corn only showed 7 per cent, making a difference of 6 per cent in favor of surface planted product. The past three seasons (1900, 1901, 1902) I have carried on in actual field work a series of experiments based upon an outline furnished me by Mr. Shamel, instructor in farm crops at the University of Illinois.

This work was all done upon the same farm. All conditions and everything connected with the tests were so arranged as to admit of an absolutely fair comparison. No single manner of raising the different parts of the field from which comparative yields was taken was given any advantage over any other part of field or manner of tending. I desire that all make a note of this, and, while I am friend to the lister method, I do not desire to depart from actual facts and fair comparisons, let the results be what they may. The season of 1900 was an unusually favorable season for surface-planted corn, and I secured 12 bushels per acre more from surface-planted corn on an average.

But the season of 1901 was an unfavorable season for the corn crop, however well it may have been planted and cultivated. This season on adjoining plots we found only four-fifths of a bushel in favor of the land which had been listed once over that which was listed twice on another plot adjoining these two already mentioned.

The land was plowed and corn planted upon the surface and secured practically the same yield per acre as where land was double listed, and consequently a decreased yield of four fifths per acre as compared with single single listing. On still another plot we plowed the land first, then afterwards listed the furrows in this plowed land before planting. We secured four bushels per acre more than by any other methed this season (1901), and with sililar results at the price for which corn was salaeble this extra operation of listing would have paid handsomely.

Now, I had quite a surprise in store for me in this experimental business. I planted two acres of sugar of beets this season, selecting my most fertile soil, of course, preparing very carefully by removing all rubbish, plowing six inches deep.

I rolled twice and harrowed it three times. After sowing all of my beet seed I had enough land remaining unplanted upon one side of the beet field to plant ten rows of corn 26 rods long. This was adjoining corn put in by listing corn stubble of the previous year once and afterward planting with the planter. I expected soil prepared for beet to far outyield the listed land, but to my very great surprise the latter produced six bushels per acre the most. All conditions were exactly the same in every detail except in the difference of preparing seed bed and planting. My plan for continuing the experiments in this line for 1902 was as follows:

Plow 4 inches deep, yield 75 bushels per acre.

Plow 6 inches deep, yield 76.8 bushels yer acfe.

Plow ordinary depth.

Listed in plowed land, 59 bushels per acre.

Listed in corn stubble one time, 72 bushels per acre.

The above on old and worn soil, but just adjoining I repeated the listing experiments on second year blue grass sod:

Single listed on corn stubble (one time), 75 bushels per acre.

Single listed in plowed land, 69 bushels per acre.

Plowed land, ordinary depth, 77 bushels per acre.

The field in which these experiments were carried on contained 19 acres. In another field 28 acres were listed in December, 1901, and again in spring, 1902:

Average yield of all surface planted corn, 76.2 bushels per acre.

Average yield of all listed corn, 68.75 bushels per acre.

Average difference in favor of surface planting, 7.45 bushels per acre.

Taking above yield as a basis, we also find the following true:

Surface planted, 76.2; single listed, 73.5; 2.7 bushels difference.

Surface planted, 76.2; plowed and listed, 64; 12.2 bushels diffence.

Surface planted, 76.2; double listed, 68; 8.2 bushels difference.

So, of all ways of using the lister this season of 1902, one listing proved to yield the largest crop. I also did not say so, but all land whese the single listing was practiced had been previously run over with a disc harrow while plowing and then listing, returned the poorest yields, almost repeating the experience of 1900 for the same method. Only once during the three years has it proved of any value; the other two seasons, 1901 and 1902, it proved to be detrimental.

This season I also kept a time account and found that by listing a field twice I could plant a given number of acres in one-third less time than by plowing the land. This included all operations in the two methods, and in the listed field the first listing was done in December, 1901, and did not occupy time in the crop season proper. This is the only time that I think double listing is profitable; that is, when the first listing is done in the fall.

As a summary of results for the past three years I give the following figures:

Year.	Surface planted.	Listed.
1900	58.53	46.4
1901	21.9	23.1
1902	76.2	68.5
Average	52.5	46

Showing a diffdrence of 6.2 bushels in favor of surface planting. This gives the lister the worst of it apparently, yet appearance are so deceiving that I am still a friend of the lister to a limited extent.

I hardly think that any one on all kinds of soil and under all circumstances would be successful with it, and very few will make a success for the first year, at least, as it is a method successful practice of which can only come by experience.

Three years does not prove much to me, and I will continue the work for two more, making five years in all, as conclusions reached any one season are perhaps reversed the next, and any statements made upon paper must necessarily be quite general after all.

LEIGH F. MAXOY.

PRACTICAL DAIRYING.

(Address of Mr. L. S. Dorsey, of Moro, Ill., Before the Madison County Farmers' Institute.)

Few words are abused as much as the word "practical." To be practical is to be capable of turning a thing to good and profitable use. So many people, especially farmers and dairymen, "know it all," and unless one's experience is identical with theirs, it does not count much with them.

It is amusing to discover that the very people who "know it all from experience" are the easiest taken in by agents for "one-minute churns," "tree agents," and the like. This address, however, is not a criticism of other people, and the remark that it is not possible for anyone of us to "know it all" is not a personal one.

To be a practical dairyman; to be "up-to date;" to be able to turn new ideas to good use; to produce and use the most economical and at the same time the most profitable foods; to have the best of cows, which receive the best of care; to secure the best of markets for dairy products, are each of them subjects of wide range, and must all be met and mastered before one is a practical dairyman.

I have always been a lover of sheep, and when the dairy was becoming the leader with me I had little thought that I would ever part with the little flock of sheep; but I had determined to be practical; if the farm was to be a practical dairy farm, everything that was in the way of making the most out of the cows must go. The sheep were such close grazers that the pastures were not in the best shape for the cattle, and somehow cows do not like to graze after many sheep, and the sheep had to go. This has always been considered as doing something that was practical.

Dairying is an art, and I consider that art consists in the ability to see and do. The mischief with us who are engaged the dairying business is that we have a great number of what may be called blind farmers amongst us who do not see the end of the beginning.

On the farm and in the dairy there are too many who seem to be contented if they do "as good as the average."

The average anywhere is not a safe place to be. In the store, farm, school, or wherever you may go in the trades or professions, or any line of business, you will find that the average don't pay; that the average is not a success.

A dairy editor sent a man to Iowa to examine and find out what 100 herds of dairy cattle were doing, and he found that over 60 of the herds did not pay for their keep.

The dairy section of the Illinois Agricultural College has a man at work in this State taking herd records of dairy cattle, and his records will show that the average dairy herd does not pay.

In my county there is a condensing factory which has 160 patrons, and of these 83 make a clear profit while 77 lose or just pay expenses.

No; I say, don't be contented to be an average dairyman. Aim high and exert every effort to make a success of the business. Study the business; if you are working with cows, steers, hogs, horses or grain, be on the lookout for better methods; don't satisfy yourself with the idea that you know it all.

I want to tell you that the dairy business was not a matter choice with me. It was a case of have to do something or bust. I was not over fond of work, and the farm was one of these poor, hilly ones, and to do something, to build it up and at the same time bring in a revenue that would meet current expenses, was the all-important issue to be met and settled.

A few cows were purchased and a start made in the dairy. We sell milk by quantity and prefer the Holstein; but our market objects to an all-Holstein dairy; so there is some Shorthorn and Jersey blood in the herd.

To secure and keep a dairy herd is one of the practical things that must be learned before success is attained.

Now let us look for moment at the dairy cow. She must not have a short, broad head nor a thick neck, but the contrary; her head should be long and thin, and broad between the eyes, and her eyes should be bright and clear; she should have a thin neck and large nostrils.

The hips of the dairy cow should be broad. She should have thin thighs, well apart, giving plenty of room for a good udder. The udder should be well developed, and I like to see plenty of veins on the outside of the udder, indicating that the udder is not fleshy.

Some cows will have two milk veins; others will have four or five branching out. The more veins she has the larger they are, and the more crooked the better. The veins do not carry milk to the udder, but return the blood from the udder to the lungs. If large and full they indicate a great deal of blood passing through, and milk is a producer of blood. Where they enter the body you will find udder holes, tender milk wells. The larger and the more there are the better, five or six of them, especially in Holstein cows.

I claim this is the best point to a good cow. When you get the udder, get the milk veins and the milk wells, and you have got the milk cow. These are are the only safe and sure signs to go by.

Having a good herd of cows, breed them up to your ideal. Select the breed you want, and buy the best bull or bull calf you can afford, or get a neighbor to go into partnership with you in buying a bull.

There is no class of farmers who work together so good as dairymen, and with me in this partership bull idea works O. K. Raise the heifer calves from your best cows. With a good herd of cows much remains before all the practical work is done.

The cows should have the best of care; kind and gentle treatment.

One of our cows has just dropped her second calf. She is a daughter of our best cow and possesses some of her mother's good points, and has been a favorite since she was born. This heifer was a persistent sucker, and so thoroughly was she attached to the sucking habit that at two years old, just after she had dropped her first calf, I noticed one day that while her calf was sucking her. she was sucking another cow. We have never known any other name for her but "Sucker," although she now seems to be completely weaned.

Sucker and I are close friends. She seems to understand that I love her, and there is an unwritten agreement between us that we will be good to each other; and when I throw my arm around her neck and tell her I will be kind to her, and pass a nubbin or apple to her, she seems to understand it all and at the milk pail she reciprocates.

All farmers are not cut out for dairymen, and many are in the business who should not be. I do not consider it practical for any one to mistreat their cows in any way. It is a shame for any one to turn their cows into a stalk field in cold, drizzling weather, or to force them to drink ice water all the winter; or, in the summer, for man, boy or dog to bring them in from the pasture on the run, or to make them stand around in the cold or mud at any time. These are not practical things for dairymen to do.

Make them as comfortable as possible at all times. It is far more profitable to sell off a part of the herd and take the best of care of what you have left.

The stable should be the best you can afford, and have plenty of light, be ventilated, warm and clean.

As to Feed.—As the cows become fresh, feed lightly at first and gradually work them up. As the feed is increased the milk flow increases. As the milk flow increases the appetite increases, and so you work them up to their capacity. They can be held to a full flow of milk only by the best of care and feeding.

A balanced ration is what we should aim to get. I know of no one feed that comes so near being just what is right as oats, cut green and fed in the sheaf or threshed and ground. I believe in a variety of feeds and think one-third each by weight of ground corn and cob, ground oats and wheat is a model feed.

When I eat I want a variety and I must judge the cow's desire by my own.

As to cotton seed meal, gluten meal, oats dust, etc., what I have fed of them does not warrant me to recommend them to be equal to the corn, oats and bran. Others, however, may have obtained better results.

Clover hay I think the best of all hay for cows, if cut at the right time and properly cured. With me clover is so uncertain that I had to resort to cow peas and soja beans for hay. Either, I think, is most as good as clover; but I prefer the Mammoth or late soja beans. I sowed 20 acres this year (1902), after the rye pasture had headed out, plowing under the rye, and, taking a Superior drill, the beans were sown one-half bushel to the acre in rows 20 inches apart. They were cultivated twice and cut and bound with the grain binder, October 15. The bundles were stood up in rows six or eight together to dry. November 15 they were hauled into the barn in as good a condition as I ever had clover or cow peas. They averaged one ton to the acre. They grew about four feet high.

I feed corn fodder in the stable, in the shed and outside. I prefer shredded fodder, as it can always be kept in a dry place. It is poor policy to have to go to the field through the winter, through all kinds of weather, for fodder; and again, if the fodder is always nice and dry and clean the cows eat it with a desire for more.

I use a rack for feeding fooder, 16 feet long, 2½ feet high and 4 feet wide. It is bottomless and very cheaply made and easily cleaned. Four posts are used for the corners; the sides are 2-inch pine, and ends 1-inch pine. It is nailed securely together; feed in it till half full of stalks, then turn it over, and it is cleaned. No fodder gets out into the mud, and it is high enough so the hogs cannot get into it.

The dairy business has much against it, compared with other lines of farm work. It is said to be too confining, and that there is so much drudgery; but I notice that in any other business, aside from farming, those who apply themselves the closest to their business are usually the ones who are the most successful, and it is also true that the farmer who sticks close by his herd of cows comes out in the end with a much better improved farm and is more of a practical and financial success thanis neighbor who is not a dairyman for fear of the drudgery and the confinement to business he must endure.

Our Friends the Birds.

Tuesday night the topic, "Our Friends. the Birds, and Why We Should Befriend Them," was discussed by Rev. W. H. Mason, pastor of the Presbyterian church of Knoxville, Ill. The speaker was bought up on a McLean county farm, and after a few words of a personal nature expressing his pleasure at meeting with the people of his old home county in so important a gathering, he spoke in part as follows:

It was clearly intended by Him who created them, so useful, so varied and so beautiful, that the world would be full of birds. They are fitted to every zone and condition of existence on sea and land. They are able to maintain themselves against the blasts of winter, the heat and tempests of summer, against food scarcity and even against the murderous tooth and claw of all their natural enemies. But they are no match for thoughtless and cruel foes, clad in boots and armed with guns, rising up against them in the homes of their ought-to-be-friends.

Even the great Julius Ceasar couldn't stand a thing like that. He could cross the Rubicon, defy the senate of old Rome, grapple the nations of the earth and weld them into universal empires, but when his friends drew their daggers against him, the mighty Caesar hid his face in his toga and sank in the shameful onslaught. Almost before their red daggers had ceased to drip, the Roman people realized that they had slain themselves in destroying Caesar.

Just so we are learnging, far too slowly, that, whenever we shoot the birds and plunder their nests, we shoot off our own financial heads through turning field and orchard over the increasing myriads of destroying pests.

Our best authorities regard 50 cents per acre as a conservative estimate of the damage now wrought by insect pests every year in Illinois. And we will be ready to agree with this estimate when we remember the worm ravages in our fruit crops together with the damage in gardens, grain fields and grass lands by innumerable creatures flying, creeping, hopping, eating perpetually. Patient investigation has discovered that there are at least 10,000 insects to the acre in our State. As a natural and very effective check upon this army of 10,000 we have kindly given us at least three birds to the acre on the average. Now, if our loss is already 50 cents per acre from insects despite the unceasing efforts of our splendid feathered friends, what it would be if there were no birds at all? Fifty cents an acre totals up almost $20,000,000 as the broad bill of Illinois insects, and the farmers and gardeners pay the bill. How much more that bill will be when we have slaughtered all the birds let every one figure out before he shoots one of these happy creatures or despoils its nest.

Going on with our figures a little further it is evident that three birds to the acre make a total of 55,000,000 pairs of birds in Illinois, and every pair of them, left alone, rears one or more broods each season. That means hundreds of millions of young birds to feed and every one of them a most voracious youngster, consuming daily more than his weight of insects and their larvae, and taxing the skill and strength of the parent birds to the limit in finding them.

Birds are such fast livers, with heart beats twice as fast as ours, with a blood temperature which would be fever heat in us, with such intense activity, that they are compelled to eat enormous quantities of food out of all proportion to their size and weight. When we put along side their high temperature, also the rapid growth of their nestlings, we can appreciate what a stupendous problem the parent birds face. If you ever undertook to feed a nest full of birdlings you realized the problem very keenly. A mother wren by actual count made 110 visits to her little ones in four hours and 37 minutes, carrying to them 111 insects and spiders. A pair of chipping sparrows made nearly 200 visits during the day, serving a meal every five minute. Fifty caterpillars, a host of crickets and other harmful creatures were among the things carried home by this pair of birds that day. Besides, they must themselves consume a liberal supply of food to maintain such astonishing activity. These are but samples of the marvelous industry of our faithful servants in feathers as any one may see for himself if he but take the pains.

And what could be more fascinating than just to watch these alert, ingenious, industrious creatures at their food hunting. Here it is a robin hopping over the lawn, bending his keen ear to find the hidden cut worm and grub at their work. How he does enjoy pulling them out of their hiding places.

And there his splendid neighbor, the yellowhammer, down in the grass a-worming. He is as useful as he is handsome. He is less bold than the robin and you will see all the better what he is about with a field glass.

And you will be equally interested in the pompous blackbird strutting about like a drum major tossing over leaves and rubbish with his stout bill as he searches out his delicacies.

Certainly nothing could be more fascinating than those fine little fellows so quick and trim hunting their food almost exclusively on the trees. With the greatest good cheer they run up and down, searching every leaf and crotch and twig, capturing the pests that lurk there. What lessons of cheerful industry they teach us. Indeed all the birds are so interesting in their native haunts that it is marvelous how any one can find more pleasure in hunting them with a gun than with an opera glass or camera. No one ever would do so if only he could get his eye open. Everything depends upon one's real seeing.

What boy is not delighted with the fine soaring of the hawk as he circles higher and higher until swallowed up in the blue ether? What a skillful hunter he is as he glides over the field, stopping to balance in midair, and then dropping down, where he sees the grass move to seize the lurking rodent.

Time fails to speak of the migrations of birds so strange and timely, or of their plumage, or their nests, or their wondrous song and the thousand other interesting things bird lovers see in these splendid creatures. Nor is there time to speak of the many lessons they teach us of industry, patience, cheerfulness, contentment, fidelity, affection. How much they have in common with the best human traits.

It is the happy privilege of parents and teachers to make all these and many other good things of bird life familiar, as a most effective means of enriching the children with the open eye and the kindly heart, thereby saving the birds.

A very practical way of getting at the value of bird life is to determine their bill of fare. This varies greatly with the seasons, the localities and with the development of the bird from nestling to adult. The most universal diet of the young of the common birds consists of soft bodied insects and their larvae. About two-thirds of all bird food consists of insects. A few of these are beneficial insects, the greater part harmful. Put this alongside the enormous quantities consumed by the hundreds of millions of ever hungry birdlings and you get some idea of the check put upon insect life by these tireless toilers.

Their service is all the more important because so well timed. Just when the insects are multiplying most rapidly and all sorts of crops at the stage where they are most easily harmed, is the very time when all our birds are hardest driven to supply food of this very sort for their clamorous young. Being so hard driven it is not strange that some of the parent birds should seek part of their own food in fruit or grain. But we never sell a few cherries or a little grain so well as in this way. Indeed if we took the pains to supply the birds with Russian mulberries and other things they prefer they would scarcely take our cherries and other valuable fruit.

Those states and countries like Carolina, Massachusetts, Prussia and England, which at some period have destroyed their birds, either through ignorance or legislation, offering bounties for really helpful birds, or through wanton cruelty, have quickly demonstrated to their sorrow what service birds render fields and gardens. For details of these costly experiments in bird destruction you will be referred to the published reports.

Perhaps the most telling way in which to set forth the economic value of birds is by showing you briefly what scientific examination of thousands of birds stomachs prove. These are careful averages made by some of our most painstaking authorities and are therefore reliable.

For detailed and very interesting information on the food habits of birds and anything else of a practical sort you care to know, I am glad to refer you to the admirable publications of the department of agriculture, which they will gladly furnish you for the asking.

(Here the speaker exhibited a series of charts illustrating the diet of all our most common birds.)

After this very hasty and imperfect outline of the economic value of our bird friends, it is pertinent to ask how shall we go about defending and preserving them against their human and other foes?

1. Enforce the laws now upon our statutes, and wherein they are wanting, coöperate to secure their amendment. Most of our states have laws for the protection of birds, some of which are admirable. But laws to be effective must be enforced. The obligation to do this rests upon every good citizen. The educational value of honestly enforced law is of the highest practical importance. In this case it will do much to arouse public opinion and save the birds.

2. Let every farmer protect his premises by shutting out the fellow with the gun. Irresponsible, thoughtless and cruel boys and men raiding the farm lands and forests blazing away at everything that can fly or run, "for the fun of the thing," works sad havoc among the birds. Put up "No Hunting" signs and prosecute trespassers and you will be doing an important part of your duty as a citizen.

3. Encourage wrens, bluebirds and other valuble species by providing nesting places for them about your homes. They will appreciate it greatly and repay your kindness a hundred fold.

4. Turn your gun on what Doctor Fisher of the Department of Agriculture calls "That gigantic fraud—the house cat." There is no creature under our control so destructive of young birds in their nests and of fledging their first attempts to fly, as this same sly, ravenous, cunning cat. We all know what inroads it frequently makes upon poultry. And how the irate housewife as soon as she finds out that her chickens are going under the woodshed with the cat starts a tragedy with John and his gun and the pet cat as principals. If we are only smart enough to have the tragedy first we shall have more chickens and birds, too.

How, through ignorance, we have sinned against hawks and owls, when the facts are they prefer rats, mice, etc., and so long as they can secure their favorite rodents will not molest feathered creatures. While the cat prefers food in feathers, and so long as these can be had, will not trouble to hunt rodents. By all means keep an eye—along the gun barrel—on the cat.

5. Birds, like human beings, have very strong food preferences. However, when hard pressed by hunger, or by the ravenous demands of their nestlings, they will take what they can get. That is quite humanlike also. This necessity sometimes sends the robin to the cherry trees and the woodpecker and the jay to the corn crib, but can't we afford to be generous with them for a little, since they are so vigilant in protecting our crops all the rest of the year?

6. Make it a point to train the children to love and protect the birds. This they will most readily do when their eyes are opened to see their beauty, and all their quaint and curious ways, their usefulness and all the interesting things about these fascinating creatures.

Have "bird days" in the schools, in which children shall give original observations upon everything they have discovered about these happy creatures. Go bird hunting with the children, but take lunch baskets and opera glasses instead of guns. Nothing more fascinating than seeing birds and animals at home. The Audubon society, as well as the Department of Agriculture, is very anxious to help teachers undertake this delightful task. Write at once to Miss Mary Drummond, secretary of the Audubon Society of Illinois, at Wheaton, who will most gladly assist you in this work.

7. Discourage the wearing of birds or feathers (except ostrich plumes or those of domestic fowls) in millinery.

We can excuse past thoughtlessness and ignorance in this matter; but now since it is known that every aigret plume represents a nest full of orphaned birdlings crying and slowly starving to death, where is there excuse of forgiveness? What is it but murdering a happy young mother and leaving her babies to die in the slow torture of starvation—that dame fashion may deck herself with the lovely mother's wedding gown? What woman with the fine instinct of mother in her heart could be a partner in such a crime?

What is true of the aigret is true of many other species of birds. Their plumage becomes more brilliant at the brooding season and this betrays them to their death to satisfy the thoughtless cruelty of a ghastly fashion and the merciless avarice of trade. Surely no true woman, who knows these things, will ever again wear such a badge as this or fail to do her best to keep others from it.

8. By means of a thorough-going champaign of education in schools, homes, newspapers, club meetings, farmers' institutes and everywhere, let people's eyes be opened to see the value of bird life. This must be done because their deadliest enemies are thoughtless and ignorant or cruel men and women.

9. Along with other means of bird protection may we not fail to ring out that fine old divine law written law in Mosaic code long centuries before Christ came to teach us that not a sparrow falls to the ground without our Father,

to-wit: "If a bird's nest chance to be before thee in the way, in any tree or on the ground, with young ones or eggs, and the dam sitting upon the young, or upon the eggs, thou shalt not take the dam with the young." * * * Why? "That it may be well with thee and that thou mayest prolong thy days."

If a law so stringent when the world was new and sparcely populated, how much more is it needed now when the food supply of hundreds of millions of people is in jeopardy through the slaughter of these innocents?

AN EDUCATIONAL EXCURSION.

(By O. J. Kern, County Superintendent of Schools, Rockford, Illinois, as Published in the School News.)

Not all of the education for the country child is acquired in the country school. It has been said that the farm educates the child as much as the school. The time is near at hand when we must teach more practical things in the district schools. The child should visit places and see things for himself. Much may thus be learned within the limits of the average district. We spend too much time in reading about things without seeing them. The polar bear gets more of the child's attention in books thon does an obnoxious weed on the farm. The average country child will hardly be called upon to study arctic animals in their native environment, but there are many things worth learning in an excursion of an hour or two in the neighborhood of the district school house.

When our boys' experiment club was organized it occurred to me that if the boys of the club and other boys of the county and their parents could have on opportunity of visiting the State College of Agriculture and the fine experiment farm at Urbana it would have a great influence on the educational and agricultural interests of Winnebago county. For three moths I thought, talked and worked to bring about such an excursion. And on Thursday, June 5, 1902, 130 boys and 150 adults—nearly six coaches full—left Rockford for Urbana. So far as I know it was the first distinctively farmers' educational excursion from Winnebago county to a great educatioual institution, the University of Illinois.

Rockford is 214 miles from Urbana, on the Illinois Central Railroad, via Chicago. After a brief correspondence with General Passenger Agent A. W. Hanson we were given a rate of $2.50 for round trip. This was but little more than one-half cent per mile. We were shown every courtesy by the officials of the road. Our coaches were attached to regular trains, leaving Chicago on the New Orleans limited and making schedule time. Returning we had a special from Chicago to ;Rockford, run as second section to the Omaha limited, which makes but one stop between Chicago and Rockford. Some of the boys drove 20 miles to reach Rockford for the early train, which left at 4:30 a. m. As far as transportation facilities were concerned nothing further could be desired.

We arrived at Champaign about noon and street cars were in readiness to take us to the university grounds at Urbana. After a lunch served us by the University in the stock judging pavilion the afternoon was spent in inspecting the experiment farms under the management of the faculty of the College of Agriculture. Superintendent Rankin, of the Agricultural College Extension Work, had met us about 20 miles north of Champaign and safely conducted us to Urbana. While at lunch we were warmly greeted by Dean Davenport and his assistants, and throughout our entire stay every courtesy was shown us and everyone tried to make our visit as pleasant as possible. They succeeded.

The ladies of the party preferred to remain at the College of Agriculture and inspect the domestic science department while the boys and men under the leadership of Superintendent Rankin and Professor Shamel were conducted over the farm. The growing crops were inspected and minute explanations were given of how they were being cared for and what experiments were being made. We inspected sugar beets, corn, soy beans, cow peas, oats, wheat and alfalfa. Some roots were pulled up of this last named plant and the boys were shown the tubercles that deposit in the ground the nitrogen taken from the air.

Next we were shown through dairy and feed barns. The boys saw fine specimens of Polled Angus and Shorthorn cattle. The afternoon closed with a visit to the orchard and gardens and spraying plant, etc. Space will permit of only the briefest mention of the afternoon's inspection. Each member of the faculty of the College of Agriculture was present to explain his particular field of operations and took the keenest delight in answering questions and making our visit profitable.

On Thursday evening a meeting was held in Morrow Hall and brief talks were made by various members of the faculty of the College of Agriculture. Each professor told how he was endeavoring to carry out the purpose of the great agricultural equipment we had just inspected.

Friday morning, June 6, was spent in inspecting the other buildings of the University of Illinois. We were shown through the armory, gymnasium, electrical and mechanical engineering halls, laboratories, library, etc. This of itself was a liberal education for the boys. The boys are still talking about the trip. One district school of Winnebago county had eleven boys attending school at the time of the excursion and all members of the boys' club. Eight of the eleven went on the excursion. And the teacher told me that during the rest of the term the boys had plenty to say during recitations about what they had seen.

To be sure, it is too soon to say what the effect wll be. We will wait patiently for the time to show results in quickened aspirations and stronger characters in growing boys. The results will be all right. If 12 boys out of the 130 become strong men in the county because of this excursion, just think of the good 12 men can do in a county for the advancement of the farm and school. Personally I am much gratified with the success of the excursion. We hope to go again next year.

Two days previous to our excursion a party of 130 went from McHenry county to Urbana under the auspices of the McHenry County Farmers' Picnic Association. And the Bloomington, Illinois, *Pantagraph*—a newspaper earnestly advocating improvement in the farm and county school—very kindly spoke as follows of the McHenry county and the Winnebago county educational excursions:

"They make careful plans and good ones and start them in operation, but do not stop with any mere theory or formal procedure, however perfect or unique, but get out into the field, see how their plans are working, and work them, revising where necessary, meeting any deficiency, putting the whole weight of their personality and influence into the project, meeting doubts, overcoming objections, securing personal pledges, absolutely doing things—and then people wonder why they succeed. * * * * * *

"Their spirit and methods should be studied, emulated and adapted to the local conditions by other would-be-successful workers in similar fields. The price of success seems to be devotion, work, plenty of it, and the ingenuity of plan that comes from great earnestness and continued brooding over things desired to be accomplished."

HOW SCHOOL MAY HELP BOYS' EXPERIMENT CLUBS.

Emma Pepper, Teacher District 58.

Some one has said, "Three things fix a man's value in life—his knowledge or what he knows, his ability or what he can do, and his character or what he is." The school is intended to help students in securing all three. We read books in order to learn what others have thought and done before us, but neither knowledge, ability or character comes from books alone. We

Some of the students of the short course in Corn Breeding and Judging at the Illinois College of Agriculture.

must study the men about us that we may learn what others are doing now, and we must study the things about us in order to learn how nature works and how we must take hold of things if we wish to succeed.

You notice what was said, "We must study the things about us if we wish to succeed." Who needs to do that more than the farmer, or the boy who intends to become a farmer? Are we in our district schools teaching the boys to study the things about them? We should be if we are striving to keep them on the farm. What could better rouse their interest or create a liking for the farm than the study of nature, or as we may call it the study of agriculture?

The Boys' Experiment club, organized almost a year ago, has begun to do something to interest the boys in farming and farm life. Effects of their work can already be seen. But the boys need encouragement and help in their work and the district school ought to give it. And how can the school do this? The first thing is to get the sympathy and interest of the parents; then their encouragement and help. And every parent ought to be interested and willing to help us in this if he wishes his boy to remain on the farm, be contented with farm life and at the same time make a success of it.

In order to encourage the boys in their experimental work the school should have an experimental garden. Here we can use the help of some of the parents and directors. They should see to it that the ground in some part of the school yard is plowed or thoroughly spaded. The pupils, under the direction of the teacher, would do the rest. The pupils could bring rakes, hoes and other tools, carefully prepare the soil and plant the seeds.

In time the seed would begin to grow and of course the weeds would also. Then the children could be taught how to keep their gardens free from weeds. They could learn the names and habits of the common weeds and the methods of ridding the soil of them, and could make experiments similar to those which the boys in the clubs have been making.

Then all along they could be taught the value of tools and the proper way of taking care of them. Perhaps, if the schools take up the study of agriculture in earnest and teach the boys some practical things, when these boys get to be farmers of Winnebago county we shall not see, as we go through the county, valuable farm implements going to rust and ruin because the farmer is too shiftless or careless or ignorant to put them under shelter.

These are some of the things we propose to teach the boys and also the girls of Winnebago county, if the parents and directors will first do their duty in the matter.

Also the pupils could be taught to take pride in keeping the garden and whole school yard neat and clean. Then when these boys get to be district school directors the teacher and pupils will not be obliged to wade through weeds in the school yard when they commence school in September; weeds so high the smaller pupils can hardly see over them. That is what some of us have had to do.

But some of you will say, "Will not all of this interfere with the regular work of the school?" It will take time, of course, but is not this as important as the regular school work? What is the use of teaching our boys how to compute compound interest if we send them from school so ignorant concerning farming that they make a failure of it? Then they will not need to know how to compute compound interest. There are some things that can be learned better from experience than from the books and those are the things we propose teaching the coming farmers of Winnebago county if you, as parents and directors, will help us.

Fred Crowley, Teacher District 24.

The degree of a man's success upon the farm depends more on himself than the farm. His intelligence and ambition, the determination, energy, the brain as well as the brawn power which he puts into his work are the factors which determine his success. These factors are the result of growth of habit, beginning with the primary education of the boy, and must necessarily begin where the boy begins.

The fact that the district school is where the boy begins, makes it the most important factor to build up agricultural interest. The work at the beginning must appeal to the interests of the boys through practical work in observing and experimenting with soil, plant life, and the farm in general.

The school garden as a means to an end has a practical bearing in agricultural education, and is in the reach of every district school at a cost not to be considered. How will the boys become practical farmers by working a school garden? Learning by practical experience how nature yields to labor under various conditions and to learn to love and care for the things that are a source of profit to the farmer and give beauty to his home. Industry is the result of this practical work which is the propelling power of knowledge.

The schools of Europe are a proof of what the school gardens can do for agriculture if placed in the hands of the pupils and their teachers. Germany leads the world in practical and profitable methods in agriculture and there the school garden is the most highly developed.

The uncomfortable school house, the neglected yard growing weeds, shadeless and barren can afford nothing to the farmer boy to inspire, to educate and interest. To improve these conditions is a duty every farmer must make his personal interest if life on the farm is to improve. A little interest, a little work, a little financial help will set these silent and practical forces at work to interest the boys upon the farm through the district school. From the school the experimental club will be recruited. A greater demand for the experimental farm, the agricultural school and the farmers' institute will be the result.

The farmers are paying too much to support a school that gives so little of real practical knowledge of the work of the farm. The school must not lead the boy away from, but to the farm. It must place in his hands the tools that are suited to his work in preparing himself for profitable employment on the farm. Books do not give practical knowledge. It is not how many problems the boy can solve in his arithmetic or what he can tell of the history lesson that measures his education. It is how much of what he learns he can apply to the practical things of life, to supply his needs and administer to his wants. The school must supply more practical methods.

The farming interest must build up a gradual growth through the schools and as practical means are supplied to teachers and pupils, the conditions of farm life will improve.

CONCENTRATION OF RURAL SCHOOLS.

We never tire of boasting that we are wiser than our fathers were. Every one of us is eligible to this particular mutual admiration society. These are the times and we are the people. It can not be denied that the world moves and at a velocity which would have seemed incredible to our grandfathers. Our knowlege of nature and her eternal laws is increasing so rapidly that the miracle of yesterday becomes the commonplace of today. We are whirled along so swiftly, and the kaleidoscope view is shifting so rapidly that we have no time to think. Now and then it dawns upon us that there is something new under the sun, that there are more things in this old world than our philosophers ever dreamed of. We can not help opening our eyes in amazement and gasping, "What next?"

This acceleration is not uniform. There was only one Prometheus whose audacity with a single effort brought down fire to be the servant of man. Howe spent years in poverty and distress until he succeed in making his sewing machine.

McCormick's first mowing machine was ridiculed, and we have heard tell what obstacles were placed in its way by the most progressive farmers. The first binder introduced in our neighborhood was burned for fear the innovation would work a great hardship on the working man. Last year we laughed at the antics of many Darius Greens; today we look with awe, wonder and admiration at their achievements. The impossible has been done so often that we are becoming credulous and ready to believe anything.

Every forward step has brought new methods of life; a new civilization. Today the farmer does nearly all his work with machinery. One man with his gang plow does more and better work than did four with the old two horse plow; and, in the west with the steam plow, he does the work of ten.

The binder enables the farmer and his hired man to take care of his large grain crop, while the combined header and separator has made possible wheat fields of thousands of acres.

Fewer men are needed on the farm. The migration is toward the city where there is more work, and greater opportunities for improvement and excitement. The census of 1900 shows that over one-half of the people live in cities. At the beginning of the century but three per cent of the people were in cities. This rapid movement toward great centers is most significant. It may be all right, but if it continues with the present acceleration for another century the farms will be almost deserted. Wise and patriotic men are today planning to counteract this movement.

The telephone, the rural mail delivery, the trolly car, the township high school and the central graded school have all been brought forward and utilized for this purpose. Men move to the city to find steady work at good wages. Intensive farming will in time overcome this tendency and furnish pleasant and remunerative employment for all who prefer the invigorating life on the farm.

Others move to the city to better enjoy the amusements and excitement. They want the daily paper and frequent intercourse with their neighbors. The trolly car permits them to live in the country and still enables them to attend lectures, theaters, operas and parties. The telephone enables the farmers and their wives to converse with each other whenever they desire, as we have evidence every time we attempt to talk over any of our county lines. The rural mail delivery brings them daily papers.

A third class move to the cities and villages to give the children the opportunity of a good school.

Those who live in the fields deserve as liberal an education as those who live on finely paved streets. The country boys and girls ought to have as good school houses, with all the appliances furnished, as the city cousins have. Justice says they should have as good teachers and as careful supervision. The country children need libraries as much as the city children and often they would make better use of them. First-class work is worth as much in the little red school house in yonder grove as in the large three story well lighted and heated urban school. The latest movement to accomplish this end is that of consolidating the country schools. We have too many schools. Hundreds of districts in the state and several in this county can not hold 110 days and pay a fair salary for a good teacher. Even the best schools in the country come far short of accomplishing what progressive farmers think their children ought to do and know. This is shown every year by the migrations to the city. The best remedy so far discovered is the central school with its hacks and wagonettes to convey the children back and forth between home and school.

At this time concentration is popular in all great industries. Enormous capital is brought together under one corporation and manufacturers are thus carried on at a greatly reduced expense. In most cases their products sell cheaper and yet they make large profits. This is done by saving and utilizing the wastes of the former methods. Since the organization of the U. S. Steel Company the saving of wastes alone is enough to insure greater dividends than the individual concerns formerly paid.

The same rule will work admirably in our school system. There are seven ungraded schools in Hillsboro township with 145 pupils enrolled and an average attendance of 100, at an expense of $1,451.50 for teachers and nearly $1,000 for incidentals, making the total cost of tuition in the country schools of the township almost $2,500 or $25 per pupil for an average term of less than seven months. This is an average of 17 cents per day or $3.50 per month per pupil. Six teams could bring all these children to Hillsboro every morning and take them home again at night at a cost not to exceed $30 a month each or $1,440 for a full term of eight months. It would require three additional teachers to accommodate them in our schools at our expense of $40 a month each, making in all $960. The janitor and fuel would not cost over $200 more. The entire expense of bringing these children to town and giving them the benefit of our graded or high school for eight months would be less than they pay for their scant seven months ungraded school at home. The conditions here are unusual. Hillsboro is in one corner of the township. A district six miles square with Hillsboro in the center could be mapped out and the expense would be considerable less and the convenience greater. In the same way every city and village in the county could be made a school center and four-fifths of the children could be provided with graded school facilities without additional cost other than the erection of suitable buildings at the beginning, but in the end it would be cheaper, because it costs less to keep one building in repairs than seven. It could easily be arranged for these wagons to carry the mail, so that during the school months at least every family could have free mail delivery. This would cut down the price of carrying the children by at least $10 per month for each wagon. Many townships in Ohio, Michigan and Iowa have free rural delivery by this method. Several townships in Ohio had rural delivery in this manner before the government took hold of it.

The hacks that carry the children in the day time are often used at night to carry the parents to the central school to attend lectures and other educational and social functions so that the school really becomes the center of the social as well as of the educational life of the consolidated district.

When the spirit of concentration takes hold of a community and the people begin to work out their plans everything unites to help it along. It would not be necessary to have such large districts, nor to have the schools in the cities and villages. Whenever the people of two districts could agree they could combine and have one school. Three, four or five districts could do the same. Where they have good frame buildings, enough of these could be moved together to a central point and all the children brought to them.

We do not propose a change in the law in reference to establishing new or changing old districts. We don't need it. All we need is a law permitting school boards to convey children at public expense. Then when a community wants a central school on this plan they can have it. We would be opposed to a compulsory law. The law in Ohio is optional. No consolidated district can be formed unless a majority of the voters of each district effected favor the change. Under this plan the schools are successful, because the people are in favor of them and will support them.

Many of our farmers have the telephone and rural mail delivery. Others are reaching out after them and ere long the farmer who does not favor these would be considered a back number. We are glad to see the leading men in each township taking hold of this question of education in the rural districts.

The prominence of the subject of education on the institute program indicates that the leaven is at work and ere we are aware the whole lump will be leavened.

The salt of the earth is in the country. The wealth of the world must come out of the loins of old mother earth. The farmer does his share in maintaining our present civilization. One-half of our people live on farms or small villages. The stability of our institutions rests heavily upon the country. The farmer needs a broad outlook, a trained hand, and an educated brain to cope with the great problems constantly forced upon him. This is not a new theory. It is an actual fact which has withstood every criticism for almost a third of a century. Necessity is the mother of invention. The shrewd Yankee is noted for his ability to turn everything to his advantage.

After the passage of the act of 1854 throwing the territories of Kansas and Nebraska open to slavery, New England sent thousands of her young energetic families to the west to save bleeding Kansas from the black blight of human slavery. The war that followed took many of her best sons. After the war the men retured with a new spirit of adventure and enterprise. They were not satisfied with the barren rock hills occupied by their fathers. Their brothers and cousins were growing rich in the west. Entire townships were almost abandoned. The sturdy son of New England proud of his common schools saw them deserted. Hundreds of schools were closed. Many kept open, had from three to ten scholars. The best men of the grand old Bay state became alarmed at the outlook. Parents were compelled to teach their children at home or send them for miles to the nearest school.

In 1869, the legislation of Massachusetts passed a law permitting the towns to levy taxes to carry students to and from school. Quincy, afterwards famous for bringing out the lamented late Col. Francis M. Parker, was the first to take advantage of the law. In 1874, the selectmen of the town closed two schools and conveyed the children to neighboring schools. Other towns tried it. It worked well. The plan grew in favor and spread over the state and across into Connecticut. There are today in Massachuetts alone 1,000 wagons conveying over 2,000 children to and from school each morning and evening. The average cost is about $1.50 per day per wagon.

After ten years' trial 166 out of 200 towns report results much better than by the old plan and 32 make no statement of results; 136 report costs less, 30 the same and 32 report costs more. Two make no report. At first there was bitter opposition, this gradually died out. Now every one seems to favor the plan. The same reports came from Connecticut. Travelers through these states are impressed with fine central school buildings and neat orderly grounds. The absence of the little red school house is everywhere apparent. A happy sight greets the traveler every morning and evening. Winding along the highways are seen the "hacks" full of merry boys and girls.

Excellent order prevails; no quarreling, no profanity no vulgarity, no abusing little ones, no smoking or chewing. The very atmosphere is elevating. There are good lap robes to keep the children warm. On cold days a stove or plenty of soap stones are used for the same purpose. The curtains are drawn and some appropriate game keeps the children busy and interested. A few minutes of 9:00 the children are landed at the school house steps with dry feet and quiet nerves ready for work. In the evening, before 5:00 o'clock they arrived at home in the same condition. Colds are less frequent. Fewer shoes and clothes are required, the morals are better so that every mother is a warm friend of the central school.

The western reserve in Ohio was settled by intilligent, sturdy New England farmers. Like New England this section of state the has always guarded the educational interests of her children. From her schools have come McKinley, Garfield, Benjamin Wade, Joshua R. Giddings and a gallery of other stars of the first magnitude. The thriving factories of this region have gradually drained the farms until they too were unable to maintain the usual number of public schools. This compelled the well to-do farmers either to move to the city or send their children away from home to be educated. Necessity forced these people to adopt the New England plan.

Early in 1891, the legislature in Ohio passed a law permitting the board of education of Kingsville township, Ashtabula county, to centralize its schools and convey the children to the central schools at public expense.

Prior to the reorganization this township had 12 teachers and 200 pupils. Now there are two schools. A small hamlet in the north part of the township had a special district which they would not give up—as they thought—to benefit their more prosperous neighbor at a town center. Six wagons bring all the children from seven former schools to the central school. The cost is from $1 to $1.50 each day, according to length of route. The longest route is four miles. Formerly they barely had the required six months' school. Now they maintain a high school and hold for nine months. The cost per capita is less than by the district plan.

C. W. Kinnear, president of the board of education, Kingsville township, says: "The result is more gratifying to all friends of higher and better education. At the election last April the centralization ticket carried by a vote of six to one showing that the people are heartily in favor of the plan after ten years' trial. The only opposition is from those who have no children or those who think their children must leave hove too early in the morning to be of any help in doing chores. This class take little interest in education."

The school of Gustavus township, Trumbull county, Ohio, seems to be the model in this line. Nine schools are united. A beautiful five-room building accommodates the children with graded and high school facilities. They have a 12 year course. The high school fits pupils for college to which they are admitted without examination. Nine covered rigs carry the children to school and home again. The routes vary from 2½ to 5 miles. The cost is from 69 cents to $1.50 per day; the average is $1.28. While this seems low they have more good applications than they can fill. The cost in this township is $250 per year more than by the old sub-district plan, but this is easily made up by the two extra months of school. The attendance has increased so that the cost per capita is no greater. Mr. C. G. Williams, a leading member of the State Grange, editor of the Ohio Farmer, is president of the board of edulation of this township and an enthusiastic supporter of the centralized school.

In Madison township, Lake county, Ohio, they have five centralized schools where formerly they had 16.

In the south side three schools are combined. In the center is the high school and three common schools combined. In the north center four schools are combined. On the east side three schools join at a little village on the township line. In the extreme north three schools are united. In this township the average attendance has increased from 217 to 293 during the first five years of the plan. This is over 35 per cent. In the same period the total expense has decreased from $7,555 to $7,243. This is taken from the report of the township superintendent for the year ending August 31, 1901.

Other townships in Ohio make the same report. Wisconsin, Michigan and Iowa have tried the plan and the same verdict comes from these states. The time is ripe for action. The coming session of the Legislature will probably enact the laws necessary to carry this plan into operation.

The farmers of old Montgomery county can do their part in the enactment of such a law. Whenever the rural districts want the central school they can have it. The Legislature is ready to act as soon as the sentiment in its favor is sufficiently crystalized to utilize and support the law. Will we launch out for something better for our children than we have had? The time for meditation and argument is passed. The time for action has come. If the proud old Prairie State wishes to maintain her present high standing in the educational world she must take another stride forward. Our own happiness, the welfare of our children and the stability of our country home demand action.

We believe the earnest, patriotic fathers and mothers of our country boys and girls will not fail to do their full duty and that they will follow the light as it beams upon their hearts and understandings and in a few more years at least we, too, will be proud of our central graded and high school.

BY JOSIAH BIXLER.

AGRICULTURE IN THE PUBLIC SCHOOLS.

(By Hon. Edward Grimes of Raymond, Director of 21st District Farmers' Institute.)

It is an evident fact, universally acknowledged by all thinking persons, that the public school is the only established and organized means by which the community may be raised along commercial and intellectual lines to a higher plane of living and useful activity. And it is generally conceded that there is no other institution in our American civilization which occupies such a warm place in the hearts of the common people. While this institution has its critics and bitter opponents, and although there may be serious flaws found in it and some of its methods and practices condemned, and while we frankly admit that the public school fund fails to do all that we expect of it, yet in spite of all this any assault upon the integrity of the system always meets with strong protest and indignation from our citizens in general.

And of this we have abundant proof. Men who are unable to provide themselves and families with any of the luxuries of life will nevertheless vote to pay taxes, even to the extreme limit, in support of a school for their own and their neighbor's children, and not only that they may have school privilege, but that they may have the very best.

Whatever may be said of our school, nothing can destroy the confidence of the people in this great system of public education, which extends its influence into every nook and corner of our great country. Wherever the stars and stripes are unfurled there you will find the American school teacher to represent our public schools and teach American ideas.

And let me say at this point, while our whole citizenship is interested in this public school system, there is no class with more interest or having greater reason to be interested than the farmers of our country. We are interested for reasons that do not apply to other people.

The public school to us is everything, but we want the very best and are not satisfied with any other kind; and we want such subjects taught as will be of most practical benefit to our communities.

We think more of practice than polish; more of substance than of shadow; more of demonstration than of theory. We want something in the line of our living, something that will make our children not only more intelligent farmers, but more thorough agriculturalists, skilled in the knowledge of plant life and the conditions necessary to produce the strongest and healthiest growth and not only so but what plants are suitable to certain soils and climates, and to this end it will be necessary to teach the chemistry and the fertilization of the soil.

This is a new subject, and farmers are just beginning to realize its importance as a study in the curriculum for the education of their children. It has been only a few years since the idea was first suggested, but it is being advocated by farmers' institutes in many different states, and in some states the prominent educators are discussing it and urging its adoption.

And we hope to see the time in the near future when in all our rural schools the subject of agriculture will be one of the regular prescribed studies; not that it shall be compulsory on the children, or that it shall be exhaustive and complete in such schools, but that the fundamentals of such knowledge shall be taught and that all (boys and girls all) shall have the opportunity to learn about plant life, its development and uses, and also about the chemistry and fertilization of the soil; and we do not want these subjects taught as some others are now taught in the public schools, merely for pleasure or polish, but for practical ends.

That as far as it is possible in the preparation of the subjects there shall be demonstration and experiment. That the soil shall be analyzed and the plant grown and that all stages of the development of the plant, from seed sowing to harvest time, shall be explained. And there must be no skimming or slighting the lessons.

And in order to the perfecting of this branch there will have to be training schools for teachers and colleges for the graduation of such as wish to complete their education along this line so that when a student finishes his education in this branch of learning he will be fully equipped to take up practical farming or become a teacher to other students.

We claim that the State, through its public schools, has a higher mission than simply to train children for intelligent citizenship. In addition to making intelligent voters, society has a greater interest in the producing power of each of its members. The limit to be put upon what shall be done in the public schools for each child should be determined by the child's ability to learn, to see, to do and know, and the ability of the tax payers to provide proper means therefor.

The duty of the State toward its children is to equip the boys and girls through the public school system for the duties devoting upon them in the business and social departments of life as well as in the political sphere of activity.

While I esteem very highly the importance of a child being able to read and write, yet for all practical purposes in the necessary struggle for the maintenance of an existence, I hold that is infinitely more important that the child be taught how to do some one thing relating to physical industry well, along with the education of the brain, the hand, the eye and ear should be well trained.

The boy or girl who leaves school with only a head knowledge of things is only half equipped for life's duties, and the training that will be of the most practical benefit to them in after life is the kind they should receive the most of. No person is prepared to render the State, society or himself high service until his entire being is developed. In the school the teacher must first appeal to the child's senses, his power of seeing, observing and doing things. Under the judicious stimulation thus given them, reading, literature, arithmetic and geography becomes living movements in the school.

When the children handle and measure things there comes an interest to them that is not found in the abstract study. To him who has studied the heavens delightful associations cluster around the many beautiful references in classic literature to the stars and their constellations.

Which is the better, to send the child to books for all he is to learn about rain, snow, dew, frost and fog, or to the fields, meadows, pastures, hills and valleys? One day in the woods or fields with a competent teacher will do more to interest the child in the knowledge of nature than one month's study in the school room with only books as a guide.

Nature study is not wholly new. As a method of study it has long been practiced by the best teachers, but as a systematized subject, to be taught in and of itself and for its own sake, it is of very recent practice. But the question now is: "Can nature study be so organized as to supplement and correlate with reading, literature, language, geography, drawing, etc.," and at the same time gradually give that knowledge and training necessary to practical tilling of the soil?

We believe that it can and soon will be done, and for this we contend and urge that the subject shall find a place in the curriculum of all the rural schools. Of course it must begin in the primary departments as a method, and if properly presented it will be found to serve the exalted purpose of adding interest and more adequate conceptions to every phase of rural school work. It will serve definite purpose to language—language lessons means something to children when used to express their own experiences and observations—doing becomes a pleasure when their own plans are wrought into it.

Nature study in any of its phases is a stimulus to school work. It gives new life to the work and gives the children some conception of realities. It quickens the zest of the scholar and confers practical benefit.

We believe that all children should be taught about the composition of the soil and the conditions necessary for the production of vegetation. Every child should know something about the climatic conditions upon which the vegetable kingdom depends. It will prove a blessing to any child to know something about plants, their great variety, uses, etc.

It won't hurt any child to know the relations of soil and climate to plant life, and how to produce the best results from a given variety of feeds, when to sow, how to cultivate and when to reap. To know these things is to have a better acquaintance with literature, science, language, geography and all other essentials of a thorough education.

But in the study of agriculture we should not limit the lessons to the simple methods adopted in the primary departments under the head of nature study. Such lessons are but the A, B, C in the course. The lessons should continue on through every grade in the school, the same as any other study, and when the scholar leaves the country school for college he should be able to continue the study there if he chooses.

There can be no question about the value of such a course of study in our rural schools. No one can deny the value of a thorough knowledge of the subject of agriculture. It will prove a benefit whether the student wishes to become a practical farmer or not. There is no kind of knowledge that will afford a greater pleasure or will add more liberally to the education and culture of the student than a knowledge of the ground and its products; a knowledge of the composition of the soil and how to utilize it to the most economic advantage in the production of good and useful things.

There never was a time in the history of man since the transgression of Adam in garden of Eden that the soil of the earth has not been depended upon for the sustenance of human life; never a time that the ground has not been cultivated and called upon to bring forth food for mankind.

The practice of agriculture is as old as the race, but the study of agriculture as an art or science (or business as you may please to call it) is of recent date. As Mr. Wilson, Secretary of Agriculture, says: "Agriculture is still in its infancy. We have not yet begun to understand it; it is a new subject, so new, in fact, that its possibilities can not be apprehended. It is a vast field, and so little has yet been accomplished in comparison of what may be done that even those most familiar with the subject will find it difficult to fully comprehend the full importance of the new agriculture.

"The government is devoting special attention to the subject and at present there are agricultural experiment stations in every state in the union; new institutions for the study of husbandry are being established.

"While there are many agricultural colleges in the country that are doing great work for the advancement of scientific husbandry by giving farmers an opportunity to educate their sons in the science of agriculture it is regretted that it is not given more attention by the state universities.

"The study of husbandry covers such a large field that the student, in order to be qualified for becoming himself an instructor must be a specialist in many ways. The study of chemistry and its relation to the composition of the soil is by itself a vast field for special study."

Every word of this quotation from the secretary's speech is true, but you will notice he makes reference only to the work done in college and experimental stations of the states. He says nothing about the study of the subject in the lower schools. Why is this? Because there is nothing being done on this subject outside of the colleges and experimental stations, and it is for this very reason that we present this paper at this time.

We believe that the time has fully come when the subject should be agitated by the farmers, and there is no better place for doing this than at a Farmers' Institute. There is no surer way of gaining the ear of the general public and no more certain method of gaining our desire than by this public means of speaking out.

Doubtless there will be objections raised to the introduction of any more studies in our schools. The cry has already gone out that the curriculum is burdensome and the studies too numerous. We will grant that objection and still contend for our point.

We believe that in some instances the list of studies is too large and the requirements upon the scholar and teacher beyond just measure, but we also believe and argue that some of the studies now in vogue could be profitably dropped from the list and thereby room made for a study of far greater value to the average child.

It is not my desire, however, to criticize in this paper, or I could name some of the subjects which I think of no practical value, and which ought to be cut out of studies. But not wishing to pose as a critic of methods or subjects, I will omit further reference to the idea of elimination and would offer this instead:

Granting that the school curriculum is already burdensome, but that the present list of studies are profitable and necessary, then I would suggest:

First—That the subjects be graded according to their intrinsic value to the child, and that the time given to each study shall be in proportion to their relative value.

Second—That no time shall be given to the learning of a lesson or the teaching of a subject that is not suitable to the capacity of all the children of that grade; and if any lesson or study must be omitted, such as are obviously taught only for polish, and of which, if pursued to graduation, can have no higher claim in education than an accomplishment, should be the ones.

In every case let the more useful—the more practical when applied to business life—have the first place, and always prominent in the list and in the work of the school room. If this is done there will be no difficulty to find time and place for the study of agriculture, and will have a greater interest to the scolar and more pleasure to the teacher qualified to teach.

And now, my friends, with this brief talk on a subject that is yet new and is capable of development beyond even my faintest hint or most obscure suggestions, I will leave it to minds better qualified than my own to continue the discussion. Expressing the house, however, in closing that the subject so poorly presented, and the idea so inadequately expressed, will be taken up and agitated by mouth, press and pen until we shall see an experiment at least when the subject of agriculture as one of the prominent studies of our rural schools. It is certain to come, but the time of its coming will depend on the interest taken in it by the farmers themselves.

FARM LIFE'S SUNNY SIDE.

(By Mrs. Buckland.)

Mrs. H. P. Buckland of Ringwood, McHenry county, made an excellent address upon "The Sunny Side of Farm Life," at the McHenry institute the evening of January 14. Her thought was highly spoken of by those present, and the following secured expressly for the Pantagraph, is a large part of what she said:

No occupation, even in this favored land, is wholly free from disadvantages or dangers of some sort. There is always some betterment of conditions to which we look forward. We wish for better results for our time and efforts, for lighter work, for shorter hours. We want more leisure for improvement recreation.

Perhaps we can do the kind of work we are doing much better than we could do any other kind, but we think, perhaps, we could make more money doing something else. We want finer clothes and bigger houses and better furniture; we want books and pictures, horses and carriages, and want to travel by sea and land. This is right if not carried too far. There would be no progress if we were entirely satisfied with present conditions, but when this spirit of dissatisfaction is given too much latitude the sunshine of happiness and contentment in which we have rested is gone and we are in the dark shadow of unrest and desperation which hides from our view all the redeeming features of our lot.

We cannot see the beauty of work well done because it is not just the kind of work we would like to do, and we lose sight of the fact that promotion seldom comes to those who slight or under-value the work in hand.

After studying the unpleasant features of the lives of those engaged in other callings, whether wholly real or partly imaginary, we turn with genuine pleasure to study the conditions surrounding country life. Though life may not be all brightness there, I hope to be able to prove that the shadows are fewer and the sunshine brighter than are found anywhere else.

1. The farming interests of our country have a wider range, and, consequently unsurpassed opportunities.

We have the wheat fields of Dakota and Minnesota, the cotton and sugar plantations of the south Atlantic and Gulf coast, the fruit farms of Michigan and southern Ohio, the orange groves of Florida and southern California, the dairy farms of the middle west and the prairie farms of the immense corn belt, and these are only a small part of farming interests carried on between the two oceans. Their combined products are unequaled in variety and abundance. When taken together the money value of the property in the hands of farmers is too great to be even comprehended. The purchasing value of the income derived from this property places our farmers in positions of greater security and independence than any other class enjoys.

2. There is less friction between employer and employé, in farming than in any other business.

Strikes and sympathetic strikes that paralyze business frequently in industrial centers and cause distress and terror and sometimes bloodshed to those involved, do not reach the farmers. We see no union and non-union troubles in agricultural districts, which is reason for no small amount of gratitude.

3. There is little danger in over production in farm products.

The world must be fed, and the farmer furnishes the food. The world must be clothed and the farmer furnishes the raw material from which clothing is made. If there is a surplus produced here our railroads soon transport it to supply a deficiency there, and this is so quickly done that the danger of exhorbitant prices for the necessities of life in any locality is lessened, as well as the danger of low prices for excess of any crop.

4. Farmers can depend on a market for their products.

When hard times come those who manufacture and deal in the luxuries and ornaments of life suffer first and most, because their goods can be more easily given up by those who use them. When people find their incomes have grown less from any reason and they cannot buy or should not buy everything they want, they buy needful things, or those they must have. A large proportion of those needful things ar furnished directly or indirectly by our farmers. A market is thus kept open for their products when many other business interests suffer severely.

5. More farmers own their homes than any other class of people.

If a season of short crops comes or a period of general financial distress they usually manage to "weather the storm" and keep their homes. To do this retrenchment may become necessary and many cherished plans must be given up, but as the temptation to lavish living and display is much less in the quiet country home than in the town home of equal means, retrenchment is much easier and more certain to occur when it becomes necessary in order to save the home.

The farmer, too, furnishes so many of the small things needed for household comfort that must be purchased by those less fortunately placed. Oftentimes the sale of the small things makes no mean addition to the income of the thrifty farmer, and is a material help in paying expenses and tiding over difficult places in farm enconomy.

Not many years ago there was a great "hue and cry" in certain political circles about the "poor farmers with their mortgaged farms," and we were asked to believe that fearful financial disaster was sure to come upon that abused though deserving portion of our population. But it never came. Individual causes of hardships there were, no doubt, for not all our farmers are provident and far seeing and some localities were unfortunate, but, as a class, the farmers of this country have a firmer footing now than ever before. They own more homes, and better ones, have better stock, better implements, better clothes and have larger bank accounts. Of one thing we can be certain, the farmers of this nation are the foundation of prosperity. When they become fit subjects for commiseration all other business interests will be paralyzed, for all others unite to form the superstructure built upon that foundation, and there can be none safer or more substantial.

6. The opportunities for the agriculturalists of the present day are apparently without limit in our country.

The broad acres of the public domain are diminishing as occupation of the less accessible portions goes on, but every year irrigation and drainage are reclaiming the swamp and the desert and adding them to the tilable land. Many portions once considered worthless for any agricultural purposes now literally "blossom as the rose," with exuberance of vegetation. Properous homes appear where dissolution reigned, and the blessings of peaceful energy are extended.

It is more difficult now for any man to "own all that joins him." The population of the older sections has become more dense and the demand for land there is now greater. The broad acres of the old settlers now command a price that he cannot resist, and his "big farm" is divided among eager purchasers or he himself divides it among members of his own family to keep them around him.

These smaller farms require different treatment, more diversified crops, more economical management, more careful, intelligent cultivation. These changed conditions require better and more exact training for the farmer to enable him to win success. It is the mission of our agricultural colleges, experiment stations, farmers' institutes, etc., to provide that training for the farmers of the present and the future. It is also the privilege of the progressive farmer to provide himself with publications that give the latest and best information along those agricultural lines in which he is most interested, and so keep himself thoroughly well informed. James A. Garfield once said: "In order to have any success in life, or any worthy success, you must resolve to carry into your work a fullness of knowledge."

This fullness of knowledge is the privilege of the farmer's wife in matters pertaining to her own sphere. Upon her devolves the duty of making her home an inspiring one to every one connected with it. She should make it comfortable, bright and sunny. She should use her best gifts to accomplish this and ask for more knowledge. There is no lack of literature to instruct her in the work of her own department, and at prices that place it within the reach of all. It is bright, attractive and instructive, and with such aid no housewife has any excuse for getting into a rut and staying there. She can get ideas enough, if she will, to make a "House Beautiful" of an humble home with food on her table "fit for a king." No women, I believe, have a better setting for a "House Beautiful" than the farmers' wives of our own rich country.

Wealth is not necessary in making an attractive home, but good taste and refinement are essential, and nowhere are both more abundant than among our own women. Wealth combined with good taste makes the beautifying of our country homes easier, but the true, refined house mother, who loves her home and family, will gather beauty around her anywhere. She cannot help it; it is a necessity of her nature, but she has her best opportunity in a country home of her own for the development of individual taste.

The country home nearly always has the merit of a roomy interior and a broad outlook. It has the stimulus of fresh air, pure water and clear skies to make one think it a good thing just to be alive and do things. There is always plenty to do; there is no denying that, nor the fact that the head of the household must always be on the "committee of ways and means" to make and keep a competency. Still there is time and energy left to develop and carry on some plan of beautifying the home and its surroundings. It is marvelous how much can be done by judicious expenditure of a little time and money about the home. How the interior can be freshened and made more comfortable and convenient and coveted pieces of furniture added. In the home grounds the possibilities are delightful. The setting of trees, shrubs and flowering plants to grow into things of beauty, and the smooth lawn, all cost but little outlay, yet they go far towards making a home, a home indeed, and a place where the boy and girl will like to stay.

A beautiful home is an object lesson that every beholder has a right to enjoy, and is sure to lead to the betterment of other homes and other lives, so the maker of that home, though seeking only to gratify an urgent, innate sense of beauty, becomes a benefactor and educator of others. The making of the "House Beautiful" ourselves and inspiring others to do likewise, is one of the bright spots in farm life. This has been going on for years until over the farming districts of this nation these beautiful homes are found to testify to the taste and energy of their owners.

When those of moderate means can do so much to make their homes attractive, we have a right to expect much more of the fortunate possessors of wealth, and our expectations have not been in vain. The log cabins of the early settlers gave way to the low roofed frame house and those in their turn to another style until now one sees new residences stately and beautiful with every modern convenience and luxury. Within are found well stocked libraries, as well read and well digested as the city home can boast. One finds, too, the best papers and magazines and the household fully up-to-date in intelligence and that knowledge of the world that comes only from thorough training and extensive travel.

The farmers' daughter now becomes a college graduate as well as her brother or her city cousin. She takes her place as mistress of the farmers' home and uses the treasures of her well stored mind to beautify and enrich it.

My own live for country and farm life began on a rock, hill-side farm in New England. * * * Life there meant hard work, strict economy and stern self-denial, if a growing family was fed, clothed and educated. But the duty was well done, and everywhere throughout the length and breadth of our land, we find the sons and daughters of those homes men and women of character and influence, stronger and better for the stern discipline of youth. If this rugged portion of our country has done so much for the children nurtured there can we not expect more from those nurtured in more favored localities where life is not so stern a reality?

There is a constantly increasing love of country life among our people. Every year the shores of our rivers and lakes becoming more thickly studded with the summer homes of those anxious to escape the city's turmoil. Our boys who have been sometimes so eager to try the excitements of the city now meet those still more eager to exchange them for the quietest nook to be found. This is having its effect on our ambitious young people. Many more are now looking for openings for their energies nearer home and in safer fields of endeavor among the sunny farms of our country.

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